
Conceptual Engineering ProductsTM 6.2

User Guide



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1 Introduction

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1.1 Background of Conceptual Engineering Suite

Conceptual analysis methods are based on the application of simplified models of process plants coupled with powerful optimization algorithms.

For the successful application of these methods, a major requisite is the realization by the user that these conceptual models have been developed to capture the essence of the system, elements and major interactions. Adding details to the system during the conceptual analysis stage results in unnecessary complications. Fundamental engineering principles are often hidden behind a vast number of details in a process simulation environment, a typical example of this is found in the separation of multi-component azeotropic mixtures in distillation columns.

A process simulation user may not be aware of the thermodynamic limits imposed by azeotropes and following the traditional trial and error approach will result in many engineering hours wasted before this fundamental behaviour is identified.

The Lifecycle Vision of plant modelling proposes that a rigorous simulation model of a facility is a highly valuable asset for the owner and not simply a design and debottlenecking tool for process engineers. A detailed simulation model of the operating asset as-is (as opposed to as-built) becomes a central repository of knowledge that can be accessed by the various agents involved in decision making.

For new facilities, the Lifecycle begins at the conceptual design stage where a limited amount of information is available and major design decisions must be made.

To stress the difference between traditional process simulation and conceptual analysis, consider the following comparison of inputs and outputs for the application of these technologies:

	Process Simulation	Conceptual Analysis
Inputs	Feed conditions (T,P), composition and flow rates are known.	Feed conditions (T,P), composition and flow rates are known. Some inputs will have to be assumed since at the early stages of process development conditions may not be well defined.
Process configuration	Well defined. User needs to know the connectivity between unit operations and details of units such as number of stages in a distillation column, etc.	Unknown. The process structure is included in the decision variables of the problem.
Outputs	Unknown. It is expected that a proper simulation model will produce with high fidelity the outputs for the units for a given set of inputs. Objective is to have a unique solution to the system.	Known. In a conceptual analysis framework the desired outputs from the process are identified in terms of product purities, flow rates and economic constraints.

It has been well documented that at the early stages of a project, and even more so for retrofitting cases, the decisions about the structure of the process will have a disproportionate impact on the final economics of the plant. In spite of all the evidence supporting this fact, it is common practice to make decisions regarding structure based on historical data only and not enough resources are applied at identifying the optimal process configuration.

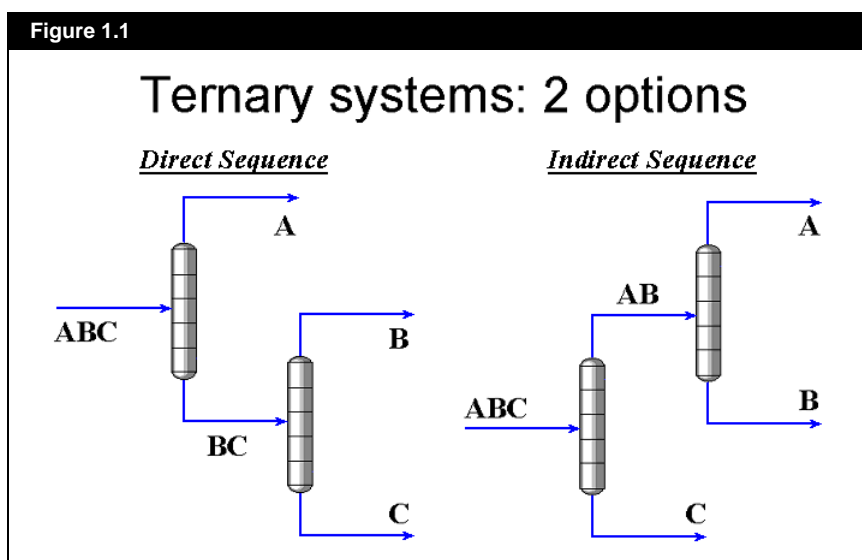
Conceptual Engineering Suite is a set of software tools that have been designed to give engineers access to the latest methods for evaluating process configurations. The product includes the ability to screen and scope alternative process configurations in a number of areas such as azeotropic distillation, complex distillation arrangements (e.g. Divided Wall Columns), and energy recovery systems.

The task of finding a flowsheet that achieves the transformation of raw materials into desired products in an economic fashion is a complex one. *It has been stated that for a typical process there may be up to 10,000 different feasible flowsheets.* The problem is then to identify the best structures without spending prohibitive amounts of resources in the process.

The main challenges that the engineer faces when applying conceptual analysis methods are discussed in the following sections.

1.1.1 Multiple solutions [combinatorial problem]

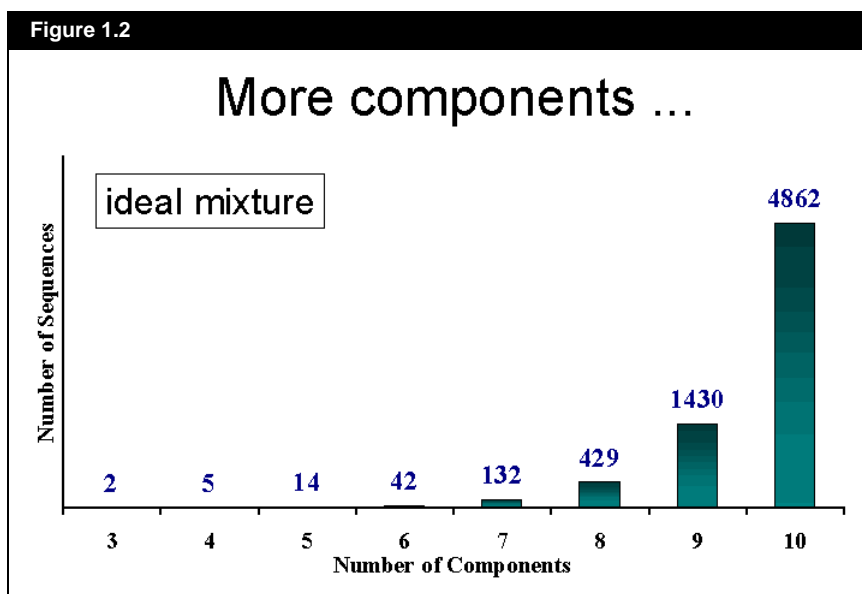
For any given design/revamp project there will always be multiple solutions regarding process structure, even when a decision on the technologies to use has been reached (e.g., distillation vs. absorption). The number of alternatives tends to be so large that there is no realistic hope of analyzing them all even at the simplest level. A classic example of this is found in separation systems for multi-component mixtures as illustrated in the figure below:



For the separation of a ternary mixture using distillation columns, we have only 2 solutions available: the direct and the indirect sequence.

As we increase the number of components in the feed to the separation system we witness a combinatorial explosion. For the example above, a mixture containing five components results in fourteen alternative flowsheets, and a feed with eight components results in four hundred and twenty nine possible configurations.

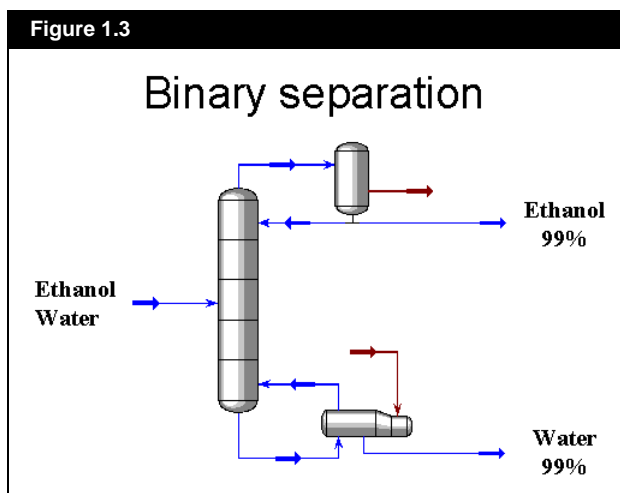
The figure below illustrates the increase in number of possible designs as the number of components increases:



1.1.2 Insights

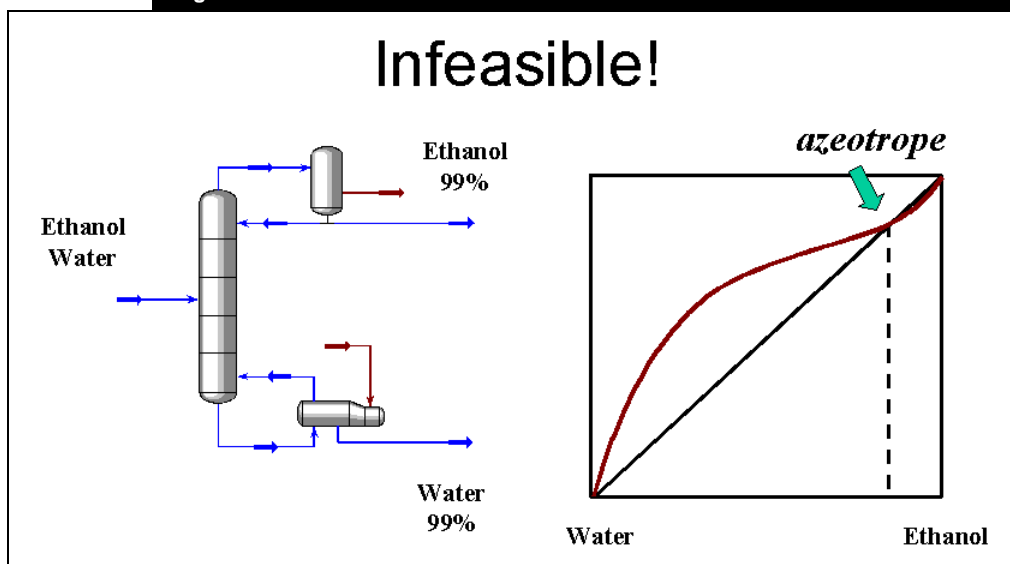
Before attempting to model and perform a rigorous simulation of a specific process or unit operation, engineers have access to fundamental physical principles that will identify early on constraints on the process, thus making the whole engineering lifecycle orders or magnitude more efficient.

Consider the *feasibility* of a distillation column. For example, a simple case of a binary separation of an equimolar mixture of water and ethanol where process/market specifications require a purity of 99% Ethanol.



A quick analysis of the vapour-liquid equilibrium behaviour of this mixture reveals the presence of the well-known binary azeotrope between these components that immediately indicates that the proposed separation is physically impossible.

Figure 1.4



The key point in the above example is that there is no need for a rigorous simulation, tray-by-tray calculation, to figure out the limitations. This is Conceptual Analysis.

1.1.3 Cost Analysis

The capital and operating costs of the equipment in the plant varies greatly depending on the design. It is one of the engineer's main objectives to find a design that is efficient in cost.

Unfortunately, a detailed cost analysis of a number of process alternatives is not usually undertaken by engineers. The reasons are:

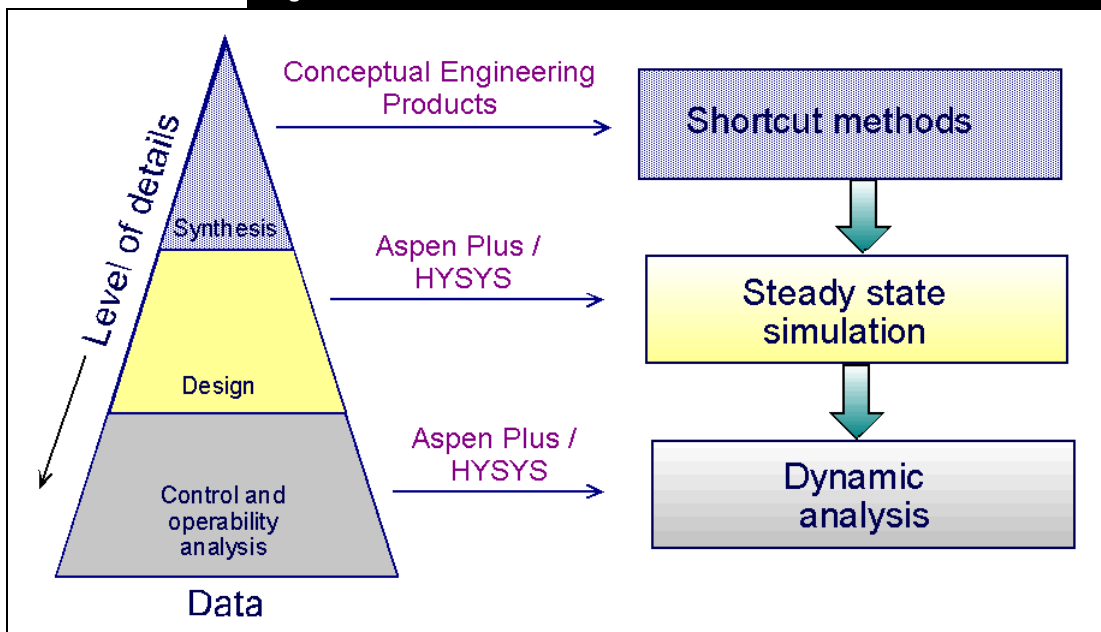
- The expense of making detailed analysis of a number of alternatives.
- Unreliable operational cost data for different processes.
- The pressure of restricted time.
- The preferences of the designer who has experience with a particular sequence of processes, etc.

Conceptual Engineering Suite provides a framework to identify cost efficient alternatives with limited amount of information.

1.2 Lifecycle Solution

Conceptual Engineering Suite fits into our LifeCycle Solution framework as illustrated in the figure below.

Figure 1.5



1.2.1 Conceptual Analysis

At the beginning of a project, the engineers has little information available mainly related to the objectives of the process, for example the market requirements for purity and volume, environmental restrictions, availability of raw materials, etc.

At this stage of the project the engineers want to:

- Screen and scope all of the process options without going into the minute details.
- Compare process options and economic performance quickly.
- Understand dominant trade offs.
- Identify a few promising candidates from several options for detailed study.

Conceptual Engineering Suite technologies allows the user to screen all design options using conceptual models coupled with powerful optimization algorithms and provides a generic and flexible framework to evaluate the effect of changing operating parameters and economic conditions.

1.2.2 Design

The results from the Conceptual Analysis stage need further validation with more detailed models. In the design stage the promising options and optimal operating parameters are seamlessly transferred to a steady state simulation environment. All the unit operation connectivity and operating parameters are initialized automatically. This not only eliminates the cumbersome step of manually inputting data from one stage to the next (from one tool to the next) but also assists greatly in converging complex flow schemes.

1.2.3 Analysis

Further examination of short-listed candidates is now done at the analysis stage. The dynamic behaviour of the flowsheet is now easily performed by setting up control loops and equipment details on top of the steady state simulation model.

Conceptual Engineering Suite is based on fundamental engineering principles. Conceptual Engineering Suite enables the creative engineering process. Conceptual Engineering Suite captures the essence of the system – no distractions with unnecessary details. Conceptual Engineering Suite – the potential for a step change in raw materials, capital and energy efficiency on your desktop.

2 Interface

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2.1 Structure Terminology

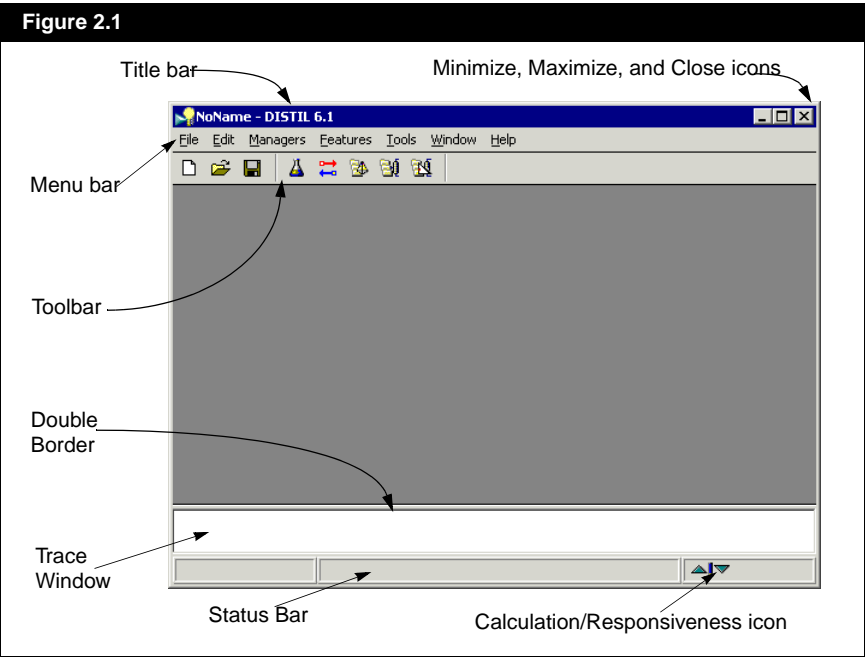
Before beginning to explain how to use the interface, some of the terminology that are used in this manual will be defined. Every file includes certain structural elements:

Structure Terminology	Definition
Fluid Package	The fluid package includes the property package, components (library or hypothetical), binary coefficients, and flash control used for flowsheet calculations. Fluid packages can be imported and exported.
Manager	<p>All Managers can be thought of as repositories for the operations they manage.</p> <ul style="list-style-type: none"> • Fluid Package Manager. Provides a single location to create or access fluid packages. • Stream Manager. Provides a single location to create or access streams. • Separation Manager. Provides a single location to create, delete or edit a suite of Separation operations including: Simple Column, Complex Column, and Three Product Systems (TPS). Available only in DISTIL. • Azeotropic Separation Manager. Provides a single location to create, delete or edit a suite of Azeotropic Separation operations including: Azeotropes Analysis, Column Design, Azeotropic Column Sequencing (ACS), Distillation Region Diagram (DRD), Residue Curve Maps (RCM), and Split Generator. Available only in DISTIL. • Thermodynamic Workbench Manager. Provides a single location to create, delete, or edit the following operations: Fluid Phase Regression, Phase Equilibrium, Property Table, and Pure Component Regression. Available only in COMThermo Workbench and DISTIL. • Heat Integration Manager. Provides a single location to create, delete or edit the following operations: Heat Integration Projects, Heat Integration Projects in Retrofit mode, and Heat Integration Cases. Available only in HX-Net.
Project	<p>The Azeotropic Column Sequencing project is an individual operation. This operation allows you to calculate azeotropes in the system, determine the structure of the distillation region, and assess the feasibility of separating multi-component mixtures. Available only in DISTIL.</p> <p>A Heat Integration Project is an individual operation that performs a heat integration analysis. A Heat Integration Project is also referred to as a HI project. Available only in HX-Net.</p> <p>Each project provides access to two lower levels: Scenario and Design.</p>
Heat Integration Case / HI Case	A Heat Integration Case is an individual operation that performs a heat integration analysis. A Heat Integration Case is also referred to as a HI case. Each HI case only contains one design. Available only in HX-Net.
Retrofit Mode	The Retrofit Mode can be entered through any HI project, and allows retrofit analysis. The HI project in retrofit mode is also referred to as a Retrofit project. Available only in HX-Net.
Case / File	A case/file is a collection of fluid packages, data, and operations. The case/file can be saved to disk for future reference. Each case/file name has the extension *.hcd when it is saved.
Session	Encompasses the work you are doing while the software is running. You can have only one session open at a time.

2.2 Desktop Terminology

The desktop displayed in the figure has been resized to fit this page.

The figure below displays the basic components of the DISTIL desktop:



The main features of the desktop are:

Desktop Features	Definition
Title Bar	Indicates the case currently loaded.
Menu Bar	Provides access to common commands through a drop-down menu system.
Toolbar	Contains various icons each of which invokes a specific command when clicked.
Status Bar	When the mouse pointer is placed over an icon in the toolbar, manager, or operation view, a brief description of its function is displayed in the status bar. Information is also displayed in the status bar if the mouse pointer is placed over cells in tables. The status bar also displays solver status information.



Calculation/Responsiveness icon



Minimize icon



Maximize icon

Session Preferences can be accessed through the menu bar only.

Desktop Features	Definition
Trace Window	Located at the bottom of the desktop view, the Trace Window is closed by default. Its main function is to display errors or warnings. For more information, refer to Section 2.6 - Trace Window .
Calculation/Responsiveness Icon	Allows you to control how much time is spent updating views versus how much time is spent performing calculations.

Some additional features about the desktop:

- There is a double border around the desktop. Any view which has a double border (including the desktop) can be sized by placing the mouse pointer over the edge or corner, when the mouse pointer becomes a double-headed arrow click, hold, and dragging the border in the direction you want to size, horizontally or vertically.
- The desktop has the special **Minimize** and **Maximize** icons reserved for application windows. These icons minimize the application to a minimized view or maximize the application to full screen depending on which icon was clicked.
- The desktop itself has both a vertical and horizontal scroll bars. These automatically appear when parts of the views within the desktop are situated outside the desktop border.

2.2.1 Menu Bar

Most of the functions in the program have hot keys or buttons associated with them, which provide quick access to their capabilities. Some of these functions can also be accessed through the menu bar. The list of menu commands or function groups, which is displayed at the top of the desktop, operates as a pull down menu system. By selecting one of the menus in the menu bar, a menu of associated commands opens.

In addition to the functions already described, the menu bar also provides access to a number of functions that can only be accessed through this route. Included in the functions that can only be accessed via the menu bar are setting Session Preferences (units, Datasheet formats, etc.) and arranging the view and desktop display.

You can access the menu bar commands in three ways:

- Select the desired menu bar item by clicking on the item, which will automatically open the associated menu.
- Press the **ALT** key in combination with the underlined letter in the menu bar title. For example, **ALT T** will open the **Tools** menu.

- Press the **ALT** key by itself to move the active location to the **File** menu in the menu bar. Once the menu bar becomes the active location in the program, you can manoeuvre through it using the keyboard. The up and down arrows move through the menu associated with a specific item, while the left and right arrows move you to the next menu bar item, automatically opening the associated menu.

If you want to switch focus from the menu bar without making a selection, press the ESC key or the ALT key.

2.2.2 Toolbar

Figure 2.2 displays the HX-Net toolbar.




The toolbar provides immediate access to the most common commands, which are also available in the menu bar.

Figure 2.2



The table below lists all the possible icons available in the toolbar for DISTIL and HX-Net:

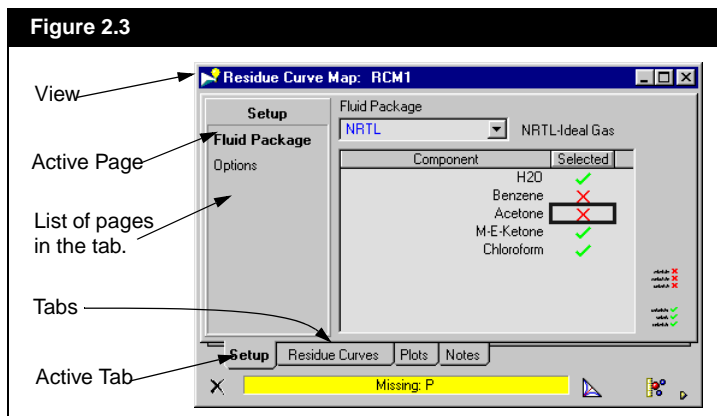
Name	Icon	Function
New Case		Allows you to create a new case.
Open Case		Allows you to locate and open an existing case/file.
Save Case		Allows you to save the active case.
Fluid Package Manager		Allows you to open the Fluid Package Manager view. Available only in COMThermo Workbench and DISTIL.
Stream Manager		Allows you to open the Stream Manager view. Available only in COMThermo Workbench and DISTIL.
Thermodynamic Workbench Manager		Allows you to open the Thermodynamic Workbench Manager view. Available only in COMThermo Workbench and DISTIL.

Name	Icon	Function
Separation Technology Manager		Allows you to open the Separation Manager view. Available only in DISTIL.
Azeotropic Separation Technology Manager		Allows you to open the Azeotropic Separation Manager view. Available only in DISTIL.
Heat Integration Manager		Allows you to open the Heat Integration Manager view. Available only in HX-Net.

2.3 View Terminology

Views are used extensively in this software in order to allow access to all information associated with an item in a single location.

Figure 2.3



Several time saving features have been built into a view.

- You will automatically return to the tab that was active the last time the view was open. Each view remembers its settings independently.
- Moving from one tab to the next is accomplished by clicking on the desired tab.

Refer to [Section 2.4 - Interface Terminology](#) for more information.

Some definitions and terminology will be presented in order to adequately explain the functionality and capabilities of the program.

Tabs

Each view is made up of tabs, which are displayed near the bottom of the view. The tabs contain relevant information and applications concerning the view. The Setup tab in [Figure 2.3](#) appears to be on top of the other tabs, indicating this is the active tab.

Pages

Each tab can be divided into pages. The pages in a tab are displayed in a list located on the left side of the tab. The pages provide access to detailed information regarding the selected tab. The Fluid Package page in [Figure 2.3](#) appears in bold letters, signifying that this is the active page.

2.3.1 Active Location

The current active location is always indicated by highlight, bold lettering, thick border, etc. Typically the active location occurs on two levels: view level and objects-within-view level.

- At the view level, the Title bar of the active view will appear in a different colour than the other opened, but inactive views. The active view will also be placed on top of the other inactive views.
- At the objects-within-view level, the active object is indicated by highlight, bold lettering, dashed frame, or a thick border. A view has only one active location, however if a view has tabs and pages, the active tab and active page are indicated by bold lettering. The active tab and page are not considered to be the current active location of the view.

For example in [Figure 2.3](#), the active tab and page are indicated with bold lettering, and the current active location is the cell in the Selected column. The active location is indicated with a thick border around the cell.

The last active cell that was used or selected, also appears in a different colour than the other cells of the matrix/table. Each matrix/table has its own active cell.

For an object to be active in the view, the view also have to be active.

2.3.2 Views Functionality

The program views have the same basic features as found in other Windows based programs:

- Minimize, Maximize/Restore, and Close icons are located in the upper right corner of most views.
- Object icon, located in the upper left corner of most views, contains the normal Windows 3.x menu.

Most of the different views found in the program are resizable to some degree.

The following list provides a brief description on resizable views:

- When the Minimize, Maximize/Restore and Close icons are available, the view can be resized vertically and horizontally.
- When only the Minimize and Close icons are available, the view cannot be resized.
- When only the Close icon or Close and Pin icons are available, the view cannot be resized.



Minimize icon



Maximize icon



Restore icon



Close icon



Pin icon

2.3.3 Minimized Views

All views can be minimized. The Minimize icon in the upper right corner of the view is used for minimizing the view. Once a view has been minimized, only the Title bar is visible. It can be re-opened by double-clicking on the minimized view or clicking the Restore icon which replaces the Minimize button in the minimized view. Minimizing and maximizing is analogous with other Windows-based applications.



Minimized View



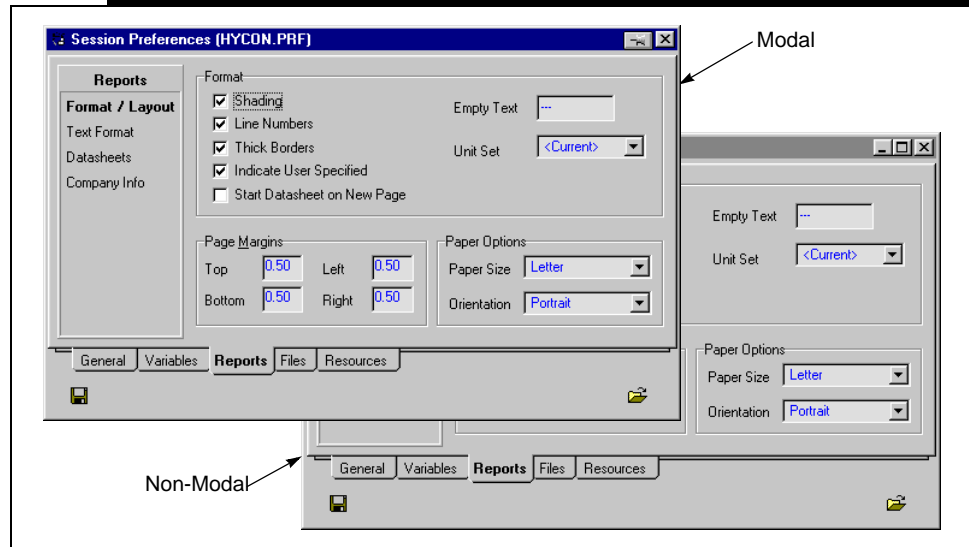
Restore icon

2.3.4 Modal vs. Non-Modal Views

When a view is modal, you cannot access any other element in the case. That is, you cannot select a menu item or view that is not directly part of that modal view. Non-modal views do not restrict you in this manner. You can leave a non-modal view open and interact with any other view or menu item by selecting it.

Example of a modal and a non-modal views are shown in the figure below.

Figure 2.4



Notice that the non-modal view is also the inactive view, indicated by the dull Title bar colour and positioned behind the active view. The modal view is the active view, indicated by the bright Title bar colour and position.



Pin icon

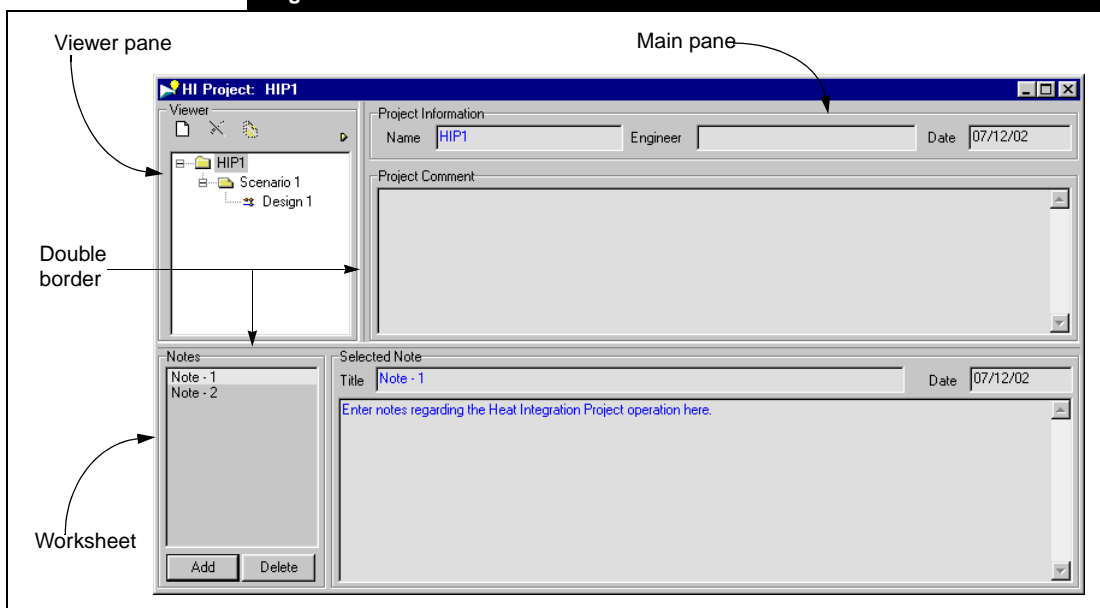
The modal view is indicated by presence of a Pin icon in the right corner of the view while the non-modal view is indicated by the Minimize, Maximize, and Close icons. A modal view with a Pin icon can be converted to a non-modal view by clicking on the Pin icon.

2.3.5 Project View

The project view type is only available in DISTIL and HX-Net.

The HI Project, Azeotropic Column Sequencing, and Column Sequencing views have the same general structure known as the project view. The figure below shows a typical project view at the Project level.

Figure 2.5



Level

You can access all three levels by using the tree browser in Viewer pane.

There are three different hierarchical levels in a project view. Each level has a specific set of views associated with it.

There can only be one top/first level in a project view. The first level can contain multiple sub-levels/second levels. Each second level can contain multiple sub-levels/third levels.

The information/objects in the project view also varies for different operations at different levels, except for the project level. The project level, as shown in [Figure 2.5](#), contains the same fields, buttons, and groups for all operation project views.

Panes

Each pane will display different information depending on the active level.

The project view in the program is divided into three panes: Viewer, Main, and Worksheet. Each pane is outlined by a double border. You can resize each pane independently by clicking and dragging the double border surrounding the pane.

The following sections describes each pane for the project view at the top/first level. All operations with project view contains the same objects/options at the top/first level.

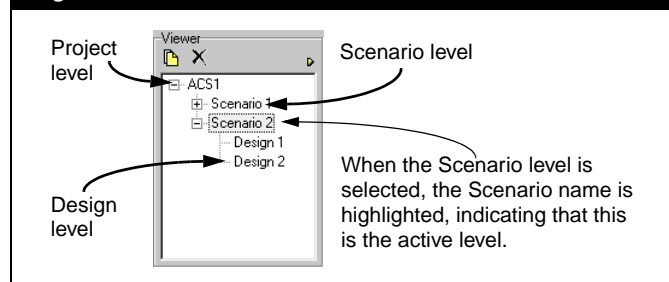
Viewer Pane

The Viewer group appears in the project view for all levels.

The Viewer pane contains the Viewer group. The group contains the tree browser which is used to access, create and delete projects, scenarios, and designs within the operation.

The tree browser is a graphical representation of all levels existing in the project view, and is organized in a hierarchical format. Multiple Scenarios can “branch” off from the Project level, and multiple Designs can “branch” off from the Scenario level.

Figure 2.6



The following is the procedure to move from level to level in a project view:

1. Open the project view (e.g., HI Project or Column Sequencing).
2. In the Viewer group, select the level you want to enter.
3. Click the + or - icons to display or hide the scenario and design levels.

Main Pane

The Main pane contains different objects, depending on the level and operation. However for all operation at Project level, the Main pane contains two groups: Project Information and Project Comment.

Project Information Group

The Project Information group allows you to enter the operation/project name in the Name field, and the designer of the operation/project in the Engineer field. The Date display field displays the current date.

Project Comment Group

The Project Comment allows you to enter information regarding the operation/project in the text editor.

Worksheet Pane

The Worksheet pane contains different objects, depending on the level and operation. However for all operation at Project level, the Worksheet contains two groups: Notes and Selected Notes.

Notes Group

This Notes group list the notes that have been added to the operation/project. You can add notes to the operation/project by clicking the Add button, change the title of the notes by entering a new name in the Title field, and delete notes by selecting the notes and clicking the Delete button. You can also read the notes already added by selecting the note in the list, the selected note will appear in the Selected Notes group.

Selected Notes

This Selected Notes group displays the selected notes. This group also allows you to modify the notes in the text editor, and enter/change the name of the notes in the Title field. The Date display field indicates when the note was last modified.

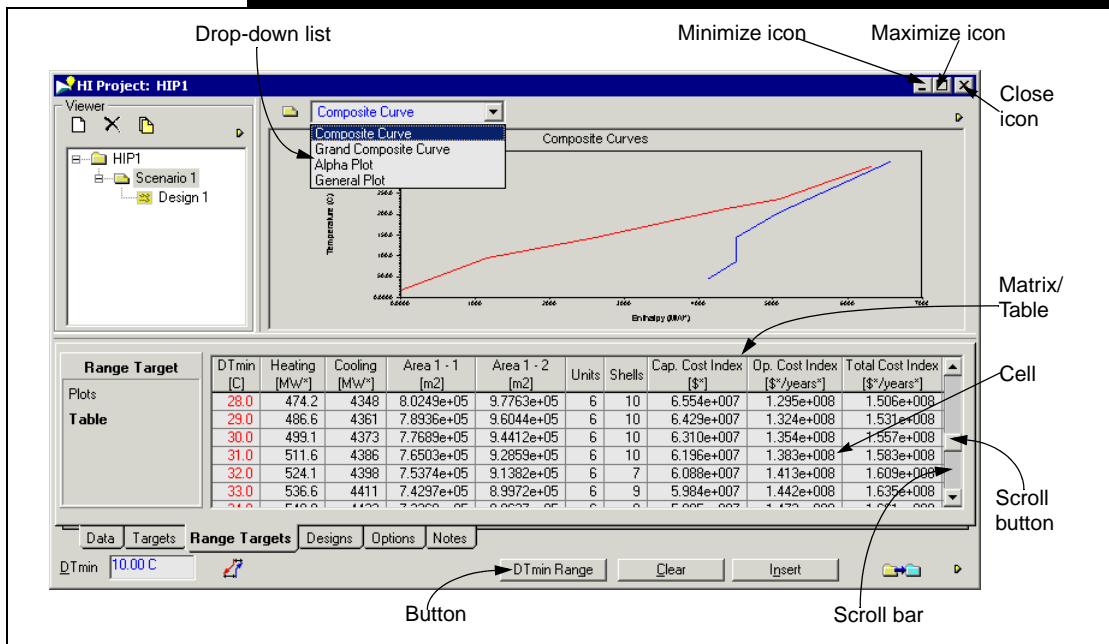
Any changes made to the information in the Project Comment text editor, will appear in the text editor located at the bottom of the Manager view when the Show Notes button has been clicked.

At Scenario and Design level, the Worksheet is the main interface area where you can input and view data concerning the operation/project.

2.4 Interface Terminology

The following figures displays some common interface objects in the program views. The table below each figure list and describes the objects.

Figure 2.7

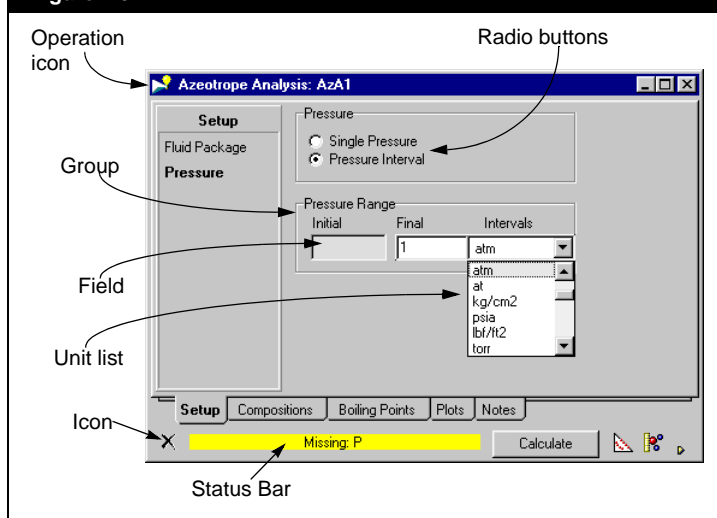


For examples, a row of information might contain all information about one stream, and one column would contain the inlet temperatures for all streams.

Interface Object	Definition
Drop-Down List	A list of available options under a given menu item, or a list of acceptable responses to a certain input cell/field.
Minimize icon	Reduces the current view into a <i>Minimized</i> view. Refer to Section 2.3.3 - Minimized Views for more information.
Maximize icon	Expands the view to its maximum size.
Close icon	Closes the view completely.
Matrix / Table	Information displayed in a tabular format. Rows of information go across the matrix horizontally, and are organized by variables into different columns, which run vertically. The top row of the matrix usually provides a description of the information for each column.
Cell	A location in a matrix or table for supplying or viewing information. Refer to Section 2.4.1 - Cells & Fields for more information.

Interface Object	Definition
Scroll Bar	Used to access information which cannot be displayed in the current size of a menu or view.
Scroll Button	Part of the Scroll Bar, this object allows you to slide up or down the list. There are also Scroll Buttons that slide the list left or right.
Button	Invokes a command when clicked. Buttons are often used to perform actions, such as deleting or adding or starting calculations. Buttons can also be used to open up other views.


Figure 2.8




Interface Object	Definition
Operation Icon	Clicking the icon will open a drop-down menu of common Windows commands. Double-clicking the icon will close the view.
Group	The organizational border within a tab that groups related functions together. Each group has its own active location.
Field	A single location in a view for supplying/entering data. Refer to Section 2.4.1 - Cells & Fields for more information.
Unit List	Upon entering data in the active field or cell, a drop-down list of units which are applicable for the parameter type of the current input cell will appear.
Checkbox	Indicates which items or settings are either active or inactive. When a checkbox is checked, a checkmark is displayed and the function is active. When a checkbox is unchecked, the checkbox is empty and the function is inactive. Clicking on the checkbox will toggle between checked and unchecked.
Radio Buttons	Found in groups of at least two, with only one being active at one time. To change the radio buttons, click on the desired option, or the empty circle beside the desired option.



Checkboxes in the Display column.

A green checkmark  indicates that the object is selected.

A red cross  indicates that the object is not selected.

For more information regarding active views, refer to [Section 2.3.1 - Active Location](#).



Interface Object	Definition
Red cross and Green checkmark	Usually found in a Selected column of a table. You can click on the red cross or green checkmark to toggle between not selected or selected status for the associated objects in the table.
Icon	Invokes a command when clicked, an icon is exactly like a button.
Status Bar	At the bottom of some individual views, tabs, and pages there is a colored bar(s). This bar will change color and display different messages depending on the status of the information displayed or entered for the respective view, tab or page.

Although several views can be displayed on the desktop at any time, only one view is active or has focus. This is indicated by the highlighting of the active view Title bar. Within a view, there is again only one location that is active.

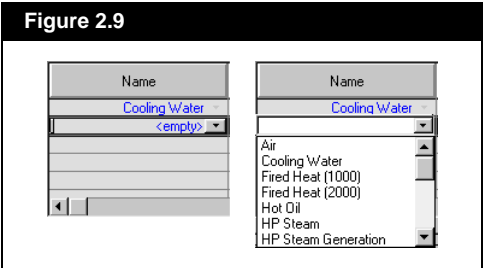
The style in which an object is distinguished as *active* depends upon the type of object (cell, button, etc.). Active buttons have heavily shaded borders and a dashed/dotted frame around the button label. In the case of a cell in a matrix/table, an active cell is distinguished by a thick cell border and/or different background colour. For an item in a list, the active item is highlighted.

2.4.1 Cells & Fields

This is a location in a view for supplying or viewing information (e.g. stream names and temperatures). Cells are grouped as part of a matrix/table, and fields are single cells in a view.

In some cases, fields or cells have an associated drop-down list, indicated by a down arrow ( or ) in the cell or field.

This is shown in the left side of [Figure 2.9](#). Clicking on the down arrow, as shown on the right side of [Figure 2.9](#), to open/access the drop-down list.



2.5 Manoeuvring Through the Interface

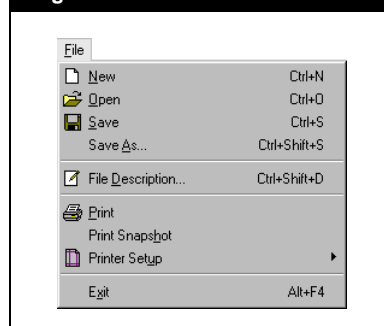
This software utilizes the Windows conventions regarding interaction between the user and the application. These are described below.

2.5.1 Hot Keys - ALT Key

Most labels such as the items on the menu bar, input cell identifiers, and button labels, have a single letter underlined. This letter works in conjunction with the ALT key as a hot key combination, the result of which varies depending on the label type.

- For the menu bar Items (**F**ile for example), pressing **ALT F** opens the drop-down menu under File.

Figure 2.10



- For field identifiers (**N**ame for example), pressing **ALT N** moves the active location directly to that field.
- For buttons (**A**dd for example), pressing **ALT A** invokes the command of the button.

The ALT key by itself automatically advances the active location to the first item in the menu bar (File). The keyboard arrows move left and right through the row, and the down arrow opens the active menu item. If a drop-down menu has underlined letters, you can invoke the command by using that letter only. For example, with the File menu open, you can start a new case by pressing the N key.

The following is a list of all hot key combinations and their related commands, including all ALT key combinations.

Hot Key Combination	Command
ALT E C also CTRL C	ClipBoard Copy
ALT E P also CTRL V	ClipBoard Paste
ALT E T also CTRL X	ClipBoard Cut
ALT F A also CTRL SHIFT S	Save Case with another name
ALT F D also CTRL SHIFT D	Set Case Description
ESC	Cancel previous action
F1 also ALT H C	Displays Help Contents
ALT F4 also ALT F X	Exit the program
CTRL C also ALT E C	ClipBoard Copy
CTRL N also ALT F N	Create a new case
CTRL O also ALT F O	Open an existing case
CTRL S also ALT F S	Save current case
CTRL V also ALT W P	ClipBoard Paste
CTRL X also ALT E T	ClipBoard Cut
CTRL F4 also ALT W C	Close current Window
CTRL F6 also ALT W D	Send the front window to the back
SHIFT F4 also ALT W E	Close all Windows
ALT F H	Print a snapshot of the active form
ALT F N also CTRL N	Create a new case
ALT F O also CTRL O	Open an existing case

Hot Key Combination	Command
ALT F P	Print active forms of the Specs sheet or Graphic
ALT F S also CTRL S	Save current Case
ALT F U G	Setup Printer for printing the PFDs, Plots, or Snapshots
ALT F U R	Setup Printer for printing Reports, Specs sheet, or Text
ALT F X also ALT F4	Exit the program
ALT H A	Displays Information about the program
ALT H B	Submit or edit Bug Reports
ALT H C also F1	Displays Help Contents
ALT I P	Displays Heat Integration Project
ALT I M	Displays Heat Integration Manager
ALT I C	Displays Heat Integration Case
ALT T P	Access to user preferences
ALT T S	Access the Script Manager
ALT W C also CTRL F4	Close current Window
ALT W D also CTRL F6	Arrange desktop Windows
ALT W E also SHIFT F4	Close all Windows
ALT W I	Arrange Icons at bottom of Screen
ALT W L	Load a Previously Saved Window Layout (or a Hidden Case)
ALT W S	Save Current Window Layout for Future Use
CTRL SHIFT S also ALT F A	Save Case with another name
CTRL SHIFT D also ALT F D	Set Case Description
CTRL SHIFT F6	Bring the last window to the front

2.5.2 Moving Through a View

There are two ways to move the active location:

- Move the mouse pointer to the object and click.
- Pressing the **TAB** key.

Each cell, field, and button on a view is sequenced. You can move the active location using the **TAB** (forward direction) and **SHIFT TAB** (reverse direction) keys.

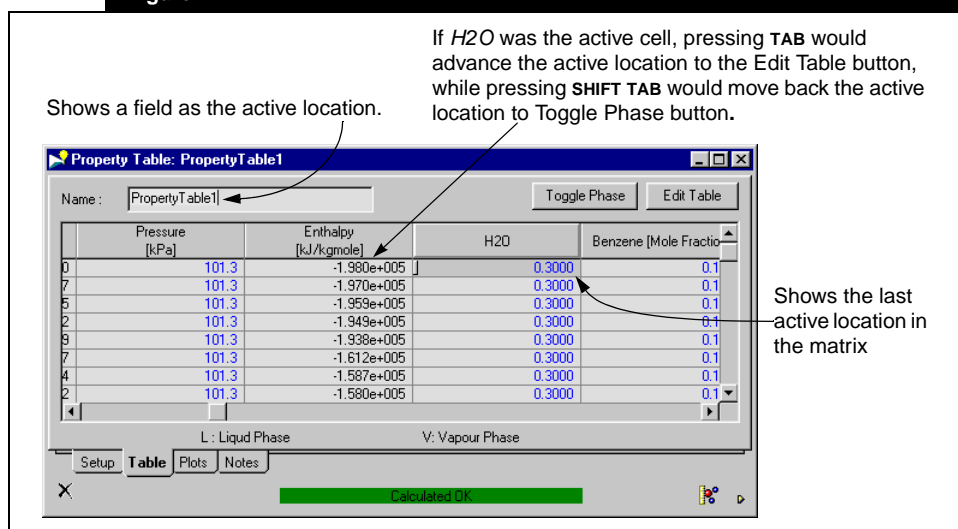
If the active location is on a cell in a matrix, the **TAB** key will not advance you to the next cell in that matrix, but rather to the next active location in the view (this can be a button or a field).

In some instances, such as input matrix found in the HI Case view, Process Streams tab, you will automatically advance to the next input cell when you press **ENTER**.

The active location of the cursor in a view is indicated in one of three ways.

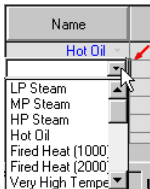
- In the case of a string (e.g. Name field), the entire string in the field will be reverse highlighted.
- If the cell/field is numerical, another border is placed outside/inside the cell/field border.
- In the case of a button, the perimeter of the button will be highlighted and the label will be surrounded by a dashed frame.


Figure 2.11



2.5.3 Entering Data

Supplying Input in Cells/Fields



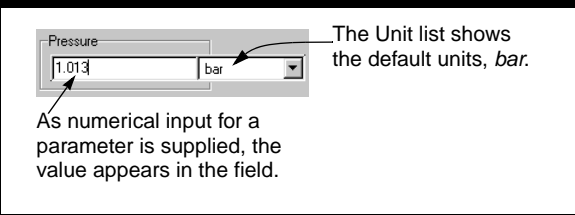
If a cell/field allows for selection from a drop-down list, the cell/field will contain a down arrow  at the right side of the cell/field.

When the required input is a name of an item (e.g., stream, utility, fluid package, etc.), you can either supply the input directly via the keyboard, or in some cases (e.g., selecting a Utility Stream name) select the item from a drop-down list of appropriate responses.


If you are supplying the input from the keyboard, (e.g., creating a new stream), click in the cell/field, then enter the text and press ENTER.

If the input is numerical, the approach is slightly different. When you begin supplying a number for a numerical cell/field, your input is displayed in the cell/field and the Unit list appears beside the cell/field. The Unit list is like a drop-down list that displays the current default unit for the cell/field property. When you have supplied the number and press ENTER, the program assumes that the default unit is the selected unit for the value entered.

Figure 2.12



If you are supplying the number in a unit other than the default, there are two methods available for identifying your unit.

Input Method	Description
Keyboard	Enter a space after the number and then begin typing in the name of the unit. The drop-down list of available units opens, and the entered unit will be highlighted in the drop-down list.
Mouse	After supplying the numerical value, but before pressing ENTER, open the drop-down list by clicking on the down arrow  and select the desired unit from the list.

Drop-down Lists and Scroll Bars

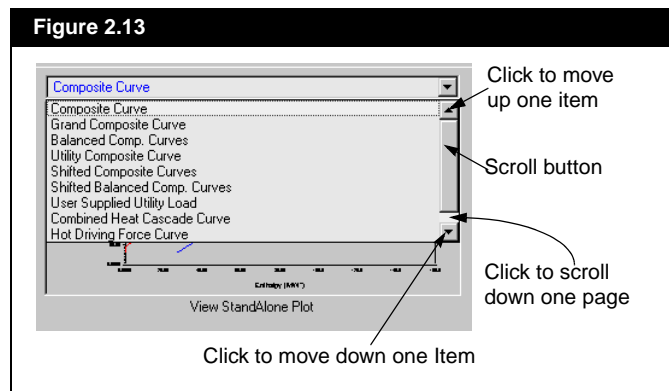
A drop-down list is indicated by a down arrow (▼) or (▼) within the cell or field.

Drop-down list provides a list of commands/options to choose as input. These commands/options can be accessed via the mouse, or by keyboard input. Once a drop-down list is opened, manoeuvring through the list is accomplished with the mouse or keyboard.

A drop-down list for a text cell/field can be opened at any time by clicking the appropriate arrow within the cell/field. This opens the drop-down list and moves the active location to that cell/field. You can also open the drop-down list for the current active cell/field by pressing the **SPACE BAR** and then the keyboard down arrow.

For a numerical cell/field, refer to the above [Supplying Input in Cells/Fields](#) section for information.

Figure 2.13



Once a drop-down list is opened, you can manoeuvre through it in several methods.

The keyboard Up and Down arrows can be used to move through the list. Pressing **ENTER** selects the highlighted item. The mouse can also be used to select the item directly.

- The most convenient method is via type-matching. Once a drop-down list is opened, keyboard input is interpreted to find the first menu item which best matches your input. As you continue to supply input, the matching continues. Pressing **ENTER** terminates the string and accepts the highlighted item. You can also use the keyboard arrow keys to move to any item.
- If the menu does not have many items, it appears without scroll bars. In this case, you can use the mouse to directly select the desired item, or use the up and down keyboard arrows to mark the item and then select it with the **ENTER** key.

- In addition, the **PAGE UP** and **PAGE DOWN** keys move the menu one page, and the **HOME** and **END** keys take you to the first and last item, respectively. The desired item is selected by highlighting it and pressing **ENTER**.
- The Scroll Bar/Scroll Button provides similar functionality. Clicking the Up and Down Scroll Arrows advance the menu one item. The scroll button can be clicked and dragged up and down to quickly scroll the menu. The desired item can then be selected by clicking on it.
- Clicking the space between the scroll button and the scroll arrow advances the menu up or down one page. The desired item can then be selected by clicking on it.

Editing Input

Editing input for a text cell/field can be done in two ways:

- When the cell/field is active, any input you supply will overwrite the previous input. In some cases, if you want to edit the text and not completely overwrite the information, you can click in the active location (the cell or field) again to reposition the cursor.
- You can use the drop-down list to replace the previous input

You have a choice when editing numerical input.

- Click the cell/field to make it the active location, then type in a new value and press **ENTER**. The input is accepted assuming the default units.
- You can change the units of a cell/field by activating the cell/field you want to change, positioning the cursor at the end of the value and pressing the **SPACE BAR**. You can then either select the new unit from the drop-down list or typematch the unit.
- Another method is via selective modification. With this route, you place an insertion point somewhere in the string and make selective changes.

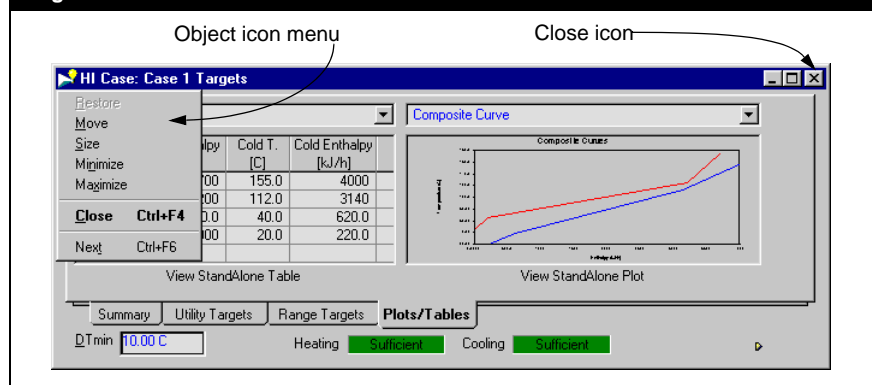
You can use the mouse pointer to make an insertion point somewhere in the number and make selective changes.

2.5.4 Closing Views

There are four ways to close a view:

- Double-click on the **Operation** icon in the upper left corner of the view.
- Click once on the **Object** icon to open the drop-down menu. The **Close** command in this drop-down menu has the **C** underlined. Press the **c** on the keyboard to close the view.
- Click the **Close** icon.
- **CTRL F4** closes the active view.

Figure 2.14




2.6 Trace Window

The Trace Window cannot be opened separately.

At the bottom of the desktop, there is a window that displays status messages and detailed solver information. This window is referred to as the Trace Window.

2.6.1 Opening and Sizing the Window

To open the Trace Window, position the mouse pointer on any part of the extra thick border directly above the status bar. When the mouse pointer changes to a sizing arrowhead , click and drag the border vertically.

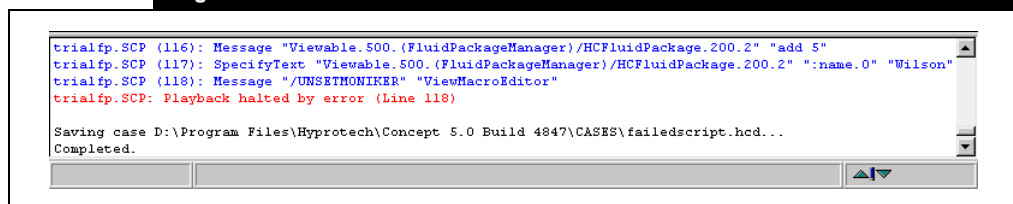
2.6.2 Available Information

The Trace Window has three main functions:

- It displays iterative calculations for certain operations. These are shown in black.
- It displays scripting commands, shown in blue.
- If an operation has an error or warning, but still solves, this message is shown in red.

An example of the contents shown in the Trace Window is displayed in the figure below. The Trace window has a vertical scroll bar, which allows you to move through its contents.

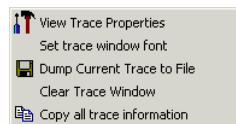
Figure 2.15



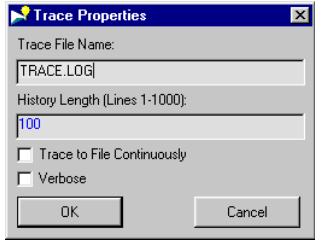
2.6.3 Object Inspect Menu

You can access the Object Inspect menu of the Trace Window by placing the mouse pointer over the Trace Windows and right-click. The figure below displays the Object Inspect menu.

Figure 2.16



The commands available in the Object Inspect menu for the Trace Window are:

Command	Description
View Trace Properties	<p>Allows you to open the Trace Properties view as shown in the figure below:</p>  <p>The features available in the Trace Properties view are:</p> <ul style="list-style-type: none"> • Trace File Name. This field displays the file name to which the contents of the Trace Window can be written (by default Trace.Log). • History Length. This field represents the number of lines that the Trace Window keeps in its history. • Trace to File Continuously. When this checkbox is checked, the Trace Window contents are written to the Trace File. • Verbose. When this checkbox is checked, the Trace Window displays solver information for all the operations in the case.
Set trace window font	Allows you to select the font size and type that appears in the Trace Window.
Dump Current Trace to File	Allows you to dump the current contents of the Trace Window into the Trace File.
Clear Trace Window	Clears all the information from the Trace Window.
Copy all trace information	Allows you to copy all the information in the Trace Window in to the clipboard.

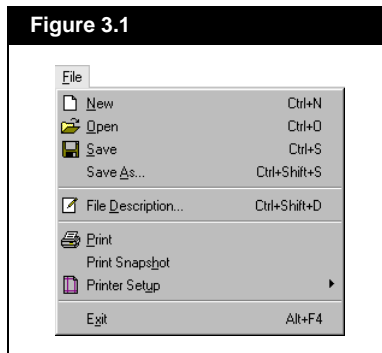
3 File Menu Options

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3.1 File Menu

The File menu is the first menu available in the menu bar. The file menu contains most of the commands related to manipulating files and all the print commands available in the program. The figure below displays the File menu.

Figure 3.1



You can access the File menu by doing one of the following:

- Move mouse pointer over the **File** menu in the menu bar and click.
- Press **ALT F**.
- Press **ALT** and press the down arrow key.

If you have previously saved a case in the program, the case name will appear below the Exit command. You can select the case name to open the case, without using the Open command. The program's quick access to case option stores up to five cases.

3.2 New Command

You can also press **CTRL N** to access the New command.

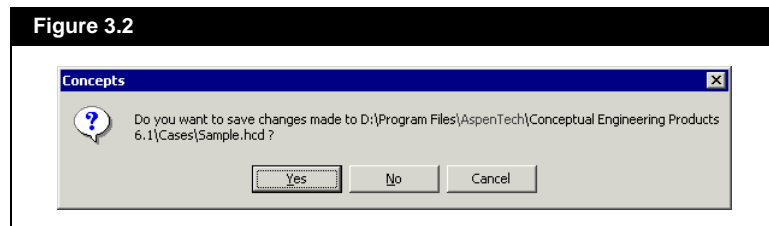
The New command creates a new case. If a case is opened when the command is selected, you will be prompted to save the current case if there have been changes since the last save.

You can have only one file open at any time. So whenever you create a new case or open a file, the program closes any active case in the program before the new case is created or selected file is opened.

To create a new case:

1. Open the **File** menu and select **New**.
 - If you have an active case that has not been modified since its last save, Concept will close the active case.
 - If you have an active case that has not been saved, the program will open a view that prompts you to select one of the three options: save the case, close the case without saving, or abort creating a new case.

Figure 3.2



2. After ensuring there are no active case, the program create a new case. The new case is indicated by the blank desktop and the **NoName.hcd** in the title bar.



New Case icons

Alternatively, you can also create a new case by clicking the New Case icon.

3.3 Open Command

You can also press **CTRL O** to access the Open command.

The Open command opens an existing case. If a case is open when the command is selected, you will be prompted to save the current case if there have been changes since the last save.

You can have only one file open at any time. So whenever you create a new case or open a file, the program closes any active case in the program before the new case is created or selected file is opened.

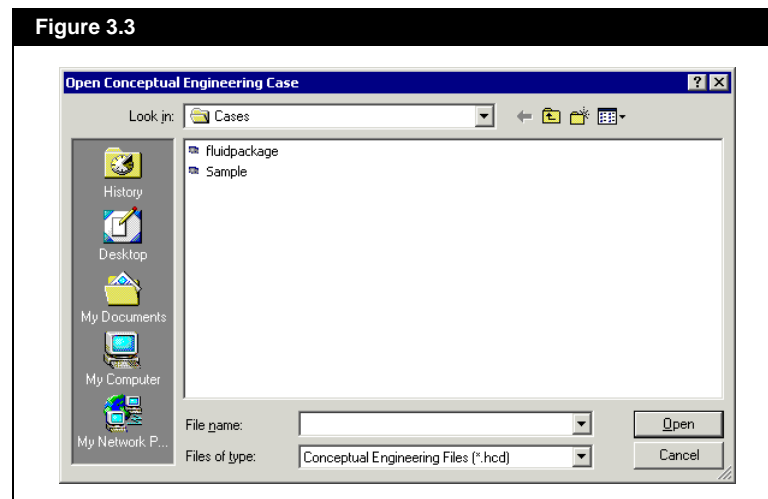
Alternatively, you can also open a case by clicking the **Open Case** icon.



To open an existing case:

1. Select **File-Open** from the menu bar.
 - If you have an active case that has not been modified since its last save, Concept will close the active case.
 - If you have an active case that has not been saved, the program will open a view prompting you to either save the case, close the case without saving, or abort creating a new case.
2. After ensuring there are no active case, the program opens the Open Case view.

Figure 3.3



3. Select the case you want to open and click the **Open** button.

3.4 Save Command

You can also press **CTRL S** to access the Save command.

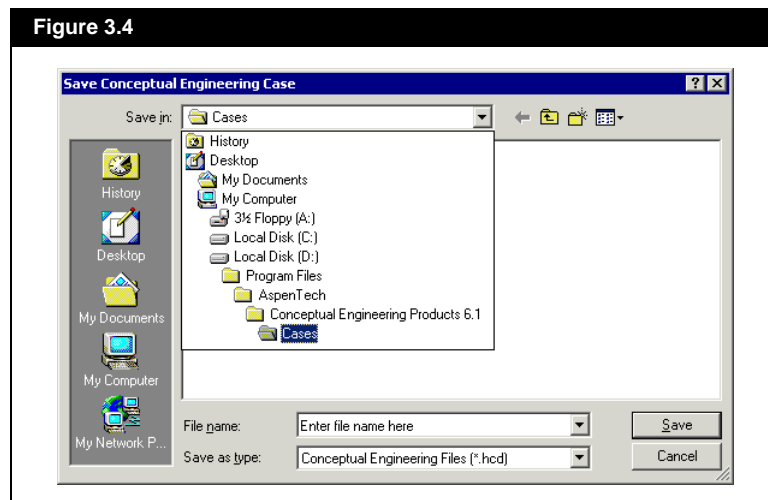
The Save command saves the active case of the program as a *.hcd file. When saving a case for the first time, use the Save command and supply the file name and file path.

To save a new case:

1. Open the **File** menu.
2. Select the **Save** command.
3. The program will open the Save Case view.
4. You must enter a name for the file in the File name field. You can also select where the file is to be saved using the Save in drop-down list.

The program automatically saved the case in the default file folder. Refer to section [Locations Page](#) from [Section 5.4.4 - Files Tab](#) for more information regarding the default file folder.

Figure 3.4



5. Click the **Save** button, when you are done entering the name and selecting the file path. The Save Case view will close, and the program will save the new case with the appropriate file extension, *.hcd.

If the case has been previously saved, the Save command updates the information in the file.

To save a previous case:

1. Open the **File** menu.
2. Select the **Save** command.
3. The program will save the active case in the same file path. The existing case in the disk is replaced with the active case.



Save Case icon

You can also save a case by clicking the **Save Case** icon. The Save Case icon has the same function as the Save command.

3.5 Save As Command

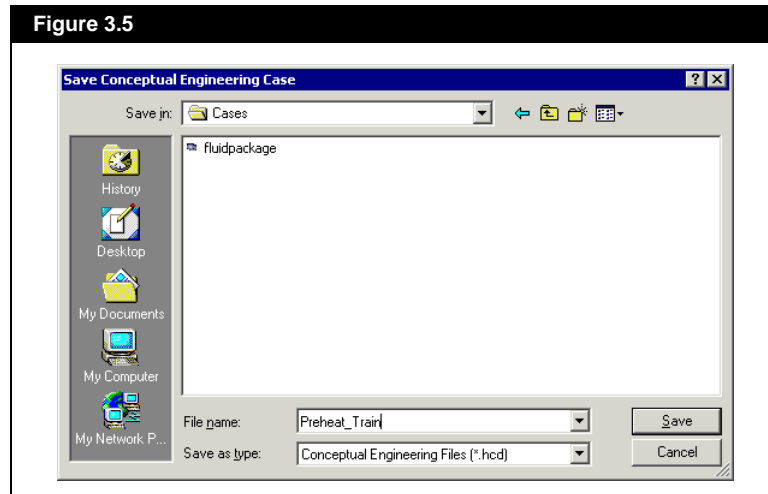
You can also press **CTRL SHIFT S** to access the Save As command.

The Save As command saves the active case of the program as a *.hcd file. If you want to change the file name or location of a previously saved case, use the Save As command.

To save a previous case as a new name or in new file path:

1. Open the **File** menu.
2. Select the **Save As** command.
3. The program will open the Save Case view.

Figure 3.5



The program automatically saved the case in the default file folder. Refer to section [Locations Page](#) from [Section 5.4.4 - Files Tab](#) for more information regarding the default file folder.

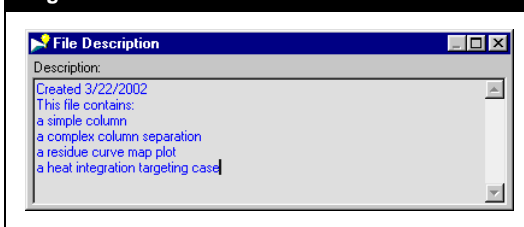
4. You can enter a new name for the file in the **File name** field. The program automatically attaches the appropriate file extension, *.hcd.
You can also select a different file path for the file using the **Save in** drop-down list.

3.6 File Description

You can also press **CTRL SHIFT D** to access the File Description view.

When you select the File Description command, the File Description view appears. The File Description provides a simple text editor for you to enter a description of the case.

Figure 3.6

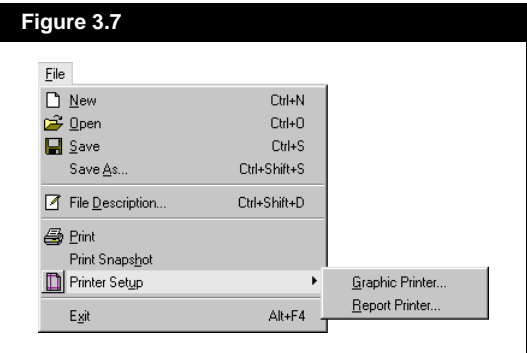


The information entered in the File Description view is saved when you save the file. So if somebody else open the file, they can access the File Description view and read what the file is about.

For effectiveness, the program recommends the File Description be used to describe the overall file, not a specific operation or project within the file.

3.7 Print Commands

There are three print commands available under the File menu.



The table below lists and describes the three print commands:

Command	Description
Print	Allows you to open the Select Datablocks to Print view. This view lists the available Datasheets for the currently active object. You can select a Datasheet and either preview or print it. Refer to Section 3.7.1 - Printing Datasheet for more details.
Print Snapshot	Allows you to print a bitmap of the currently active view. Use this command when you want to print a view that does not have a Datasheet associated with it. Plots can be printed using this command.
Printer Setup	Opens a sub-menu containing two commands: Graphic Printer and Report Printer. If you select the Graphic Printer command, the Print Setup view for graphics appears. The Print Setup view allows you to select the printer, paper orientation, paper size and source. Use the Graphic Printer command to setup the printer when printing plots and snapshots. If you select the Report Printer command, the Print Setup view for reports appears. The Print Setup view allows you to select the printer, paper orientation, paper size and source. Use the Report Printer command to setup the printer when printing Datasheets, reports, and text.

The Print Setup view varies with different printers.

3.7.1 Printing Datasheet

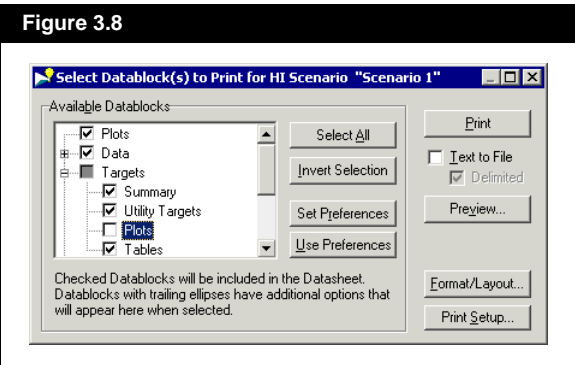
The list of available datablocks in the Select Datablocks to Print view varies depending on the selected view.

The Datasheet displays all *Worksheet*-related information, which can include input specifications and calculated results. You can customize the information displayed in the Datasheet on the Select Datablocks to Print view.

To access the Select Datablocks to Print view:

1. Select the view containing the information you want to print.
2. Then select the **Print** from the **File** menu.

The figure below displays the Select Datablocks to Print view for an Azeotrope Analysis view.



The following table lists and describes the object in the Select Datablocks to Print view:

Object	Description
Available Datablocks list	Contains all the Worksheets available for the Datasheet of the selected view. You can expand the list by clicking the “+” symbols beside the Worksheet, or shrink the list by clicking the “-” symbols beside the Worksheet. You can select which Worksheets will appear in the Datasheet by checking or unchecking the corresponding checkboxes in the Available Datablocks group.
Select All button	Allows you to check all the Worksheet in the Available Datablocks list, thus informing the program to include all the Worksheets information into the Datasheet.
Invert Selection button	Allows you to reverse the status of all the checkboxes in the Available Datablock list. So any checked checkboxes in the list becomes uncheck and vice versa for unchecked checkboxes.

Example:

You can save a preference for the Column Design view, and apply the preference to a different Column Design view. However, you cannot apply the preference to an Azeotrope Analysis view.

This button is available when the Text to File checkbox is unchecked.

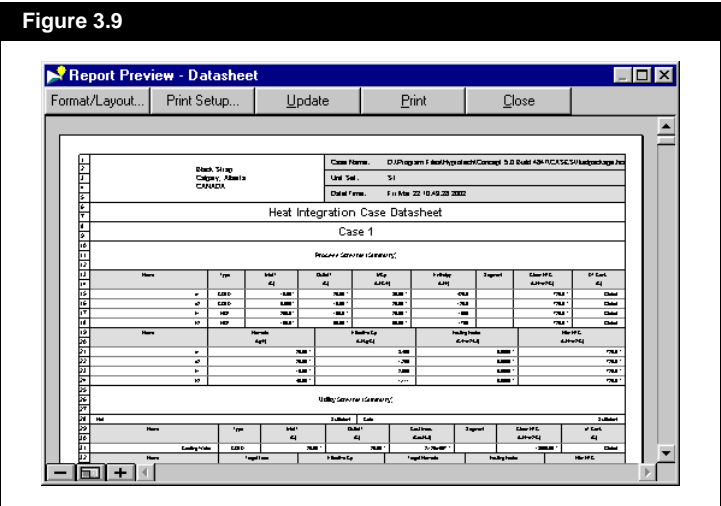
This button is available when the Text to File checkbox is checked.

Object	Description
Set Preferences button	Allows you to save the current status of the Worksheet checkboxes in the list as a preference. You can apply the saved preferred selection/preference into other Datasheets with the same view type.
Use Preferences button	Allows you to apply the saved preference on to the Datasheet of the current view. If no preference was saved, the program default preference setting is applied. The default preference is to include all the available Worksheet into the Datasheet.
Print button	Allows you to print a physical copy of the Datasheet using the current setup on the Select Datablocks to Print view.
Text to File checkbox	Check this checkbox to print the Datasheet to an ASCII file. When this checkbox is checked the Delimited checkbox is made active and the Format button replaced the Format/Layout button.
Delimited checkbox	Check this checkbox to apply the delimiter in the ASCII file. This checkbox is only available if the Text to File checkbox is checked.
Preview button	Allows you to open the Report Preview view. The Report Preview view contains an image of how the printed Datasheet will look like. Refer to section Report Preview View for more information.
Format/Layout button	Allows you to open the Session Preferences Format / Layout view. This view allows you to manipulate the format and layout of the Datasheet. The view is also the same as the Reports tab, Format / Layout page in the Session Preference view. For more information regarding the Session Preferences Format / Layout view, refer to Section 5.4.3 - Reports Tab .
Format button	Allows you to open the Session Preferences Text Format view. This view allows you to manipulate the format of the Datasheet. The view is also the same as the Reports tab, Text Format page in the Session Preference view. For more information regarding the Session Preferences Text Format view, refer to Section 5.4.3 - Reports Tab .
Print Setup button	Allows you to open the Print Setup view. This view allows you to select the printer, the paper orientation, the paper size, and the paper source.

Report Preview View



To access the Report Preview view, click the Preview button on the Select Datablocks to Print view.

The Report Preview view allows you to see the Datasheet before printing a physical copy or saving the Datasheet as a text file. The figure below displays a Report Preview view of a Heat Interrogation case.



The following table lists and describes the objects available on the Report Preview view:

Object	Icon	Description
Format/Layout button		Allows you to open the Session Preferences Format / Layout view. This view allows you to manipulate the format and layout of the Datasheet. The view is also the same as the Reports tab, Formate / Layout page in the Session Preference view. For more information regarding the Session Preferences Formate / Layout view, refer to Section 5.4.3 - Reports Tab .
Print Setup button		Allows you to open the Print Setup view. This view allows you to select the printer, the paper orientation, the paper size, and the paper source.
Update button		Allows you to update the information/values on the Datasheet.
Print button		Allows you to print the current Datasheet.
Close button		Allows you to close the Report Preview view.
Zoom Out icon		Allows you to zoom out/away from the Datasheet image.

Object	Icon	Description
ZoomFit icon		Allows you to resize the width of Datasheet image to fit into the current view.
Zoom In icon		Allows you to zoom in/towards the Datasheet image.

3.7.2 Printing Plots

For more information about printing plots, refer to [Section 8.5 - Print Plot](#)

There are two methods to print a plot:

- Select the plot view, and then select the **Print Snapshot** from the **File** menu.
- Right-click the plot area and select the **Print Plot** command from the **Object Inspect** menu.

3.8 Exit Command

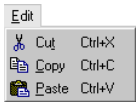
You can also press **ALT F4** to access the Exit command.

Select the Exit command to close and leave the program. You will be prompted to save the current case if any changes occurred since the last save.

4 Edit, Managers, & Features Menu Options

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4.1 Edit Menu



Edit menu

The following commands are available in the Edit menu:

Command	Description
Cut	Allows you to remove the selected cell(s) from the current view. You can then use the Paste function to place the removed cell(s) in another location or in another application.
Copy	Allows you to copy the selected cell(s) to the Clipboard. You can then use the Paste function to place the copied cell(s) in another location or in another application.
Paste	Allows you to place the copied or cut selections in the location of your choice.

4.2 Managers Menu

The Managers menu contains a list of commands to open the various manager views. Depending on which program package you bought, some commands may be unavailable.

You can access the Managers menu by doing one of the following:

- Move mouse pointer over the **Managers** menu in the menu bar and click.
- Press ALT M.

4.2.1 DISTIL

In DISTIL, the following commands are available in the **Managers** menu:

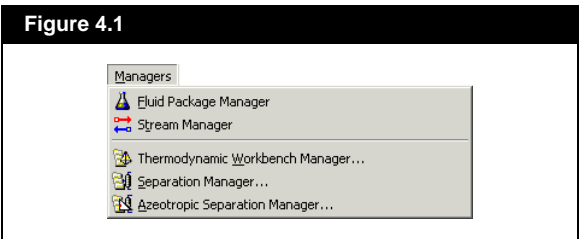


Figure 4.1

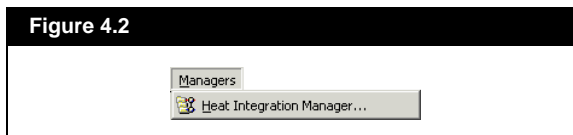
A brief description of each command is provided in the table below along with a link to the chapter that contains more information about the command:

Command	Description	For more information:
Fluid Package Manager	Allows you to open the Fluid Package Manager view. This view manages fluid packages which are the basis for some simulation cases.	Refer to Chapter 9 - Fluid Package Manager .
Stream Manager	Allows you to open the Stream Manager view. This view contains a number of material streams.	Refer to Chapter 6 - Stream Manager from the Thermodynamic Workbench manual.
Thermodynamic Workbench Manager	Allows you to open the Thermodynamic Workbench Managers view. This view manages the creation, deletion, and modification of the four thermodynamics operations: Phase Equilibrium, Property Table, Pure Component Regression, and Fluid Phase Regression.	Refer to Chapter 1 - Thermodynamic Workbench Manager from the Thermodynamic Workbench manual.
Separation Manager	Allows you to open the Separation Manager view. This view manages the creation, deletion, and modification of the four separation operations: Simple Column, Three Product System, Column Sequencing, and Complex Column.	Refer to Chapter 1 - Separation Manager from the Separation manual.
Azeotropic Separation Manager	Allows you to open the Azeotropic Separation Manager view. This view manages the creation, deletion, and modification of the six separation operations: Azeotrope Analysis, Residue Curve Map, Distillation Region Diagrams, Column Design, Azeotropic Column Sequencing, and Split Generator.	Refer to Chapter 1 - Azeotropic Separation Manager from the Azeotropic Separation manual.

4.2.2 HX-Net

In HX-Net, the **Managers** menu contains only one command:

Figure 4.2



Refer to [Chapter 1 - Heat Integration Manager](#) from the **Heat Integration** manual.

- **Heat Integration Manager.** Allows you to open the Heat Integration Manager view. This view manages the creation, deletion, and modification of the two Heat Integration operations: HI Projects and HI Cases.

4.3 Features Menu

The Features menu contains a list of commands to open the operation/ tool property views. Depending on which program package you bought, some commands may be unavailable.

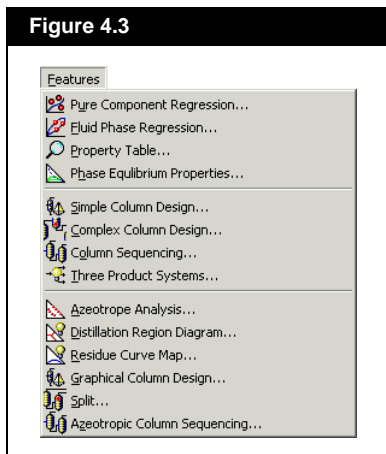
You can access the Features menu by doing one of the following:

- Move mouse pointer over the **Features** menu in the menu bar and click.
- Press ALT F.

4.3.1 DISTIL

In DISTIL, the following commands are available in the **Features** menu:

Figure 4.3



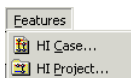
A brief description of each command is provided in the table below along with a link to the chapter that contains more information about the command:

Command	Description	For more information:
Pure Component Regression	Allows you to access/create a new Pure Component Regression operation.	Refer to Chapter 4 - Pure Component Regression from the Thermodynamic Workbench manual.
Fluid Phase Regression	Allows you to access/create a new Fluid Phase Regression operation.	Refer to Chapter 5 - Fluid Phase Regression from the Thermodynamic Workbench manual.
Property Table	Allows you to access/create a new Property Table operation.	Refer to Chapter 3 - Property Table from the Thermodynamic Workbench manual.
Phase Equilibrium Properties	Allows you to access/create a new Phase Equilibrium Properties operation.	Refer to Chapter 2 - Phase Equilibrium from the Thermodynamic Workbench manual.
Simple Column Design	Allows you to access/create a new Simple Column Design operation.	Refer to Chapter 4 - Simple Column from the Separation manual.
Complex Column Design	Allows you to access/create a new Complex Column Design operation.	Refer to Chapter 2 - Complex Column from the Separation manual.
Column Sequencing	Allows you to access/create a new Column Sequencing operation.	Refer to Chapter 5 - Column Sequencing from the Separation manual.
Three Product Systems	Allows you to access/create a new Three Product Systems operation.	Refer to Chapter 3 - Three Product System from the Separation manual.
Azeotrope Analysis	Allows you to access/create a new Azeotrope Analysis operation.	Refer to Chapter 2 - Azeotrope Analysis from the Azeotropic Separation manual.
Distillation Region Diagram	Allows you to access/create a new Distillation Region Diagram operation.	Refer to Chapter 5 - Distillation Region Diagram from the Azeotropic Separation manual.
Residue Curve Map	Allows you to access/create a new Residue Curve Map operation.	Refer to Chapter 6 - Residue Curve Map from the Azeotropic Separation manual.
Graphical Column Design	Allows you to access/create a new Column Design operation.	Refer to Chapter 4 - Column Design from the Azeotropic Separation manual.
Split	Allows you to access/create a new Split Generator operation.	Refer to Chapter 7 - Split Generator from the Azeotropic Separation manual.
Column Sequencing	Allows you to access/create a new Azeotrope Column Sequencing operation.	Refer to Chapter 3 - Azeotropic Column Sequencing from the Azeotropic Separation manual.

4.3.2 HX-Net

In HX-Net, the following commands are available in the **Features** menu:

Figure 4.4



A brief description of each command is provided in the table below along with a link to the chapter that contains more information about the command:

Command	Description	For more information:
HI Case	Allows you to access/create a new Heat Integration Case operation.	Refer to Chapter 2 - Heat Integration Case from the Heat Integration manual.'
HI Project	Allows you to access/create a new Heat Integration Project operation.	Refer to Chapter 4 - Heat Integration Project from the Heat Integration manual.

5 Tools Menu Options

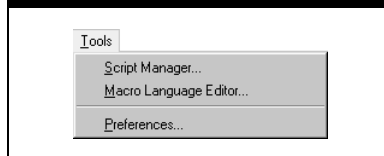
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5.3 Macro Language Editor	5
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5.4.2 Variables Tab	9
5.4.3 Reports Tab	17
5.4.4 Files Tab	21
5.4.5 Resources Tab	24

5.1 Tools Menu

You can access the Tools menu by doing one of the following:

- Move mouse pointer over the **Tools** menu in the menu bar and click.
- Press **ALT T**.

Figure 5.1



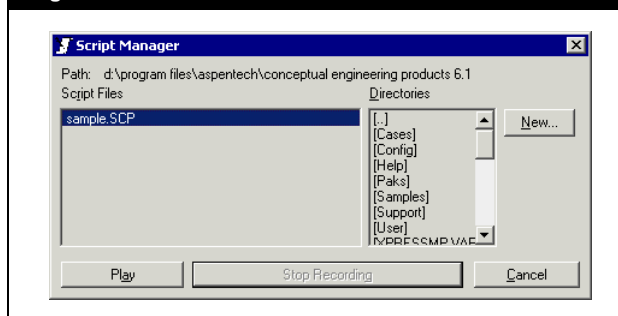
The following commands are available in the Tools menu:

Command	Description
Script Manager	Allows you access to the Script Manager.
Macro Language Editor	Allows you access to the program's Macro Language Editor view.
Preferences	Allows you access to the Session Preferences.

5.2 Script Manager Command

The Script Manager view is a tool that records all your case interaction, with respect to all information specified. The recorded script can be played back at a later time. Select the Tools-Script Manager command from the menu bar to open the Script Manager view.

Figure 5.2



The following are some important points when using the Script feature:

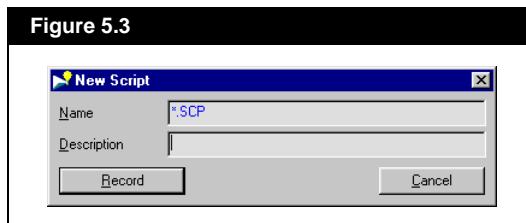
- Changes made in the Session Preferences are not saved in the script.
- Scripting is always done in the program internal units.
- Scripting is Name specific, so stream and operation names in a script must be identical to those in the case in which you are running the script.
- For the playback of a script, the simulation case **MUST BE EXACTLY** as it was when the script was recorded, so that the program can perform all the steps in the script.

5.2.1 Recording

The procedure for recording a new script is as follows:

1. Save your simulation case. Since the case must be in exactly the same condition for playback of the recorded script, this is generally a good idea.
2. Open the **Tools** menu.
3. Select **Script Manager**. The Script Manager view appears.
4. Select a directory from the **Directories** list in which the script file will be saved.
5. Click the **New** button. The program closes the Script Manager view and displays the New Script view.

Figure 5.3



6. Enter a name in the Name field for the script. If you want, you can also enter a description for the script in the Description field. If you did not add an extension to the script file name, the program automatically adds the *.scp extension.
7. Click the **Record** button to start recording. The program closes the New Script view. Notice the red **Record** icon in the lower right corner of the desktop.
8. Perform each task that you want to record.



Record icon

9. When you finish recording commands, open the Script Manager view and click the **Stop Recording** button.

If you would like to save the case, *DO NOT* save it with the same name as in step #1, as this will prevent you from playing back the script.

5.2.2 Playback

At any time during the playback, you can stop the script by opening the Script Manager view and clicking the Stop Play button.



Playback icon

In order to play a script, the simulation case must be in the same state as it was prior to the recording of the script.

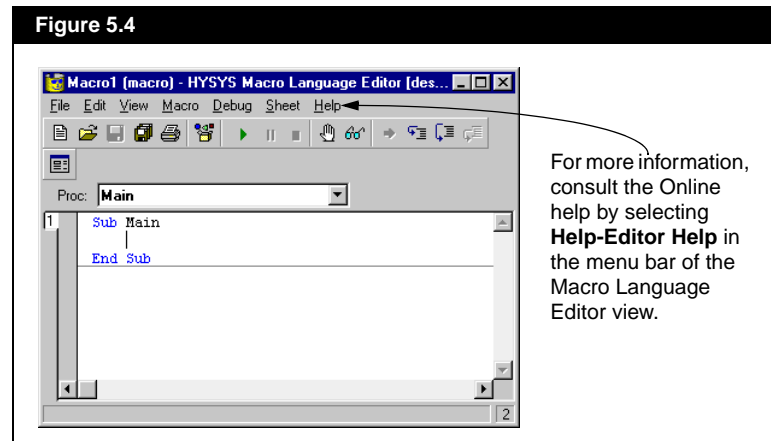
Follow this procedure to play a script:

1. Open the case that is associated with the script.
2. Open the **Tools** menu.
3. Select **Script Manager**. The Script Manager view appears.
4. Select the script name in the Script Files list. If your script is not listed in the default directory, you can select a different path in the Directories list.
5. Click the **Play** button. The program closes the Script Manager view and begins playing back the script. Notice the green **Playback** icon in the lower right corner of the desktop.

The steps of the script playback are shown in the Trace Window.

5.3 Macro Language Editor

Selecting the Macro Language Editor command opens the program's Macro Language Editor view as shown below.



The Macro Language Editor is an interactive design environment for developing, testing, and executing WinWrap Basic scripts. The editor uses a syntax that is similar to Microsoft Visual Basic®.



5.4 Preferences

The Session Preferences view in the program is used to specify default information for the simulation case. This information includes Units, Colours, Fonts, Icons, etc., for the simulation. The Session Preferences can be saved for the use in other files, and more than one Session Preferences can be created and saved.

The Session Preferences view can be accessed only through the Tools menu.

You can open the Session Preferences view by selecting **Preferences** from the Tools menu. The Session Preferences view contains five tabs: General, Variables, Reports, Files, and Resources.

Common to each tab are the two icons along the bottom of the Session Preference view.

Name	Icon	Description
Save preference file		Allows you to save the preference to a file. You must provide a new file name and/or location to which the preference is saved.
Load preference file		Allows you to load the saved preferences from a previous program session.

Saving a Session Preference

To save a preference file:

1. Click the **Save preference file** icon. The Save Preference File view appears.
2. Specify the name and location for your preference file.
3. Click the **Save** button.



Save preference file icon

Loading a Session Preference

To load a preference file:

1. Click the **Load preference file** button. The Open Preferences File view appears.
2. Browse to the location of your preference file (*.prf).
3. Select the file you want to load and click the **Open** button.

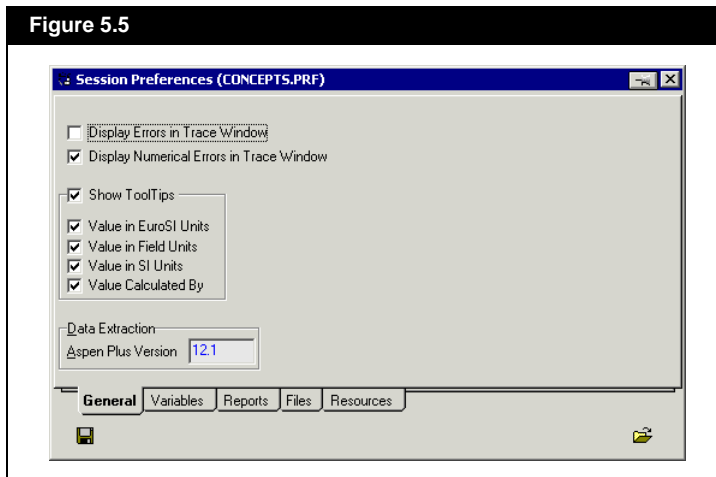


Load preference file icon

5.4.1 General Tab

The General tab shown in the figure below contains three groups: Errors, Show ToolTips, and Data Extraction.

Figure 5.5



Data Extraction Group

The Data Extraction group allows you to specify the version of the Aspen Plus backup file you are going to extract information from. For example, the simulation file that contains the information you want was created in Aspen Plus version 11.1. Enter **11.1** in the **Aspen Plus Version** field.

The value in the Aspen Plus Version field is only applicable to HX-Net.

Errors Group

The Errors group contains two checkboxes which when checked will send the specified errors to the Trace Window. When these checkboxes are checked, you will not be prompted to acknowledge errors.

Show ToolTips Group

Name	Inlet T [C]	Outlet T [C]	S
HP steam	255.0	254.0	
MP steam	205.0	204.0	
LP steam	150.0	255.0	C
CW	30.00	491.0	F

For instance, you can view stream data in the Data tab, Process Streams page of a HI Case view, by placing the cursor over any cell in the table and the tool tip appears.

Tooltip is a pop up or fly by that contains information related to an object. The tool tips are displayed by placing the mouse pointer over the associated object.

The Show ToolTips group contains five checkboxes that allows you to customize what information appears on the tool tips.

- **Show ToolTips.** Check this checkbox to display the tool tip for objects that contain tool tip information.
When the Show ToolTips checkbox is checked, the Use ToolTips checkbox in the **Resources** tab, **Cursors** page will also be checked.
- **Value in EuroSI Units.** Check this checkbox to display the EuroSI units in the tool tips. Uncheck this checkbox to remove the EuroSI units from the tool tips.
- **Value in Field Units.** Check this checkbox to display the Field units in the tool tips. Uncheck this checkbox to remove the Field units from the tool tips.
- **Value in SI Units.** Check this checkbox to display the SI units in the tool tips. Uncheck this checkbox to remove the SI units from the tool tips.
- **Value Calculated By.** Check this checkbox to display the method of calculation in the tool tips. Uncheck this checkbox to remove the method of calculation units from the tool tips.

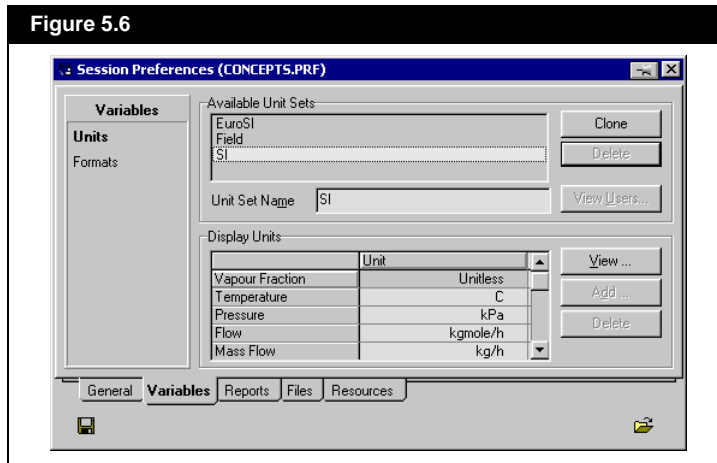
5.4.2 Variables Tab

The Variables tab contains two pages: Units and Formats.

Units Page

The Units page allows you to select the unit that is to be used in the current session.

Figure 5.6



The Unit page contains two groups: Available Unit Sets and Display Units.

The following table contains a list and description of the objects in the Available Unit Sets group:

Object	Description
Available Unit Sets list	Allows you to select the unit set for the current session and contains all the unit sets available in the current session.
Clone button	Allows you to clone a default unit set. You can only modify custom unit set. Refer to section Adding a New Unit Set for more information.
Delete button	Allows you to delete only custom unit sets. Refer to section Deleting a Unit Set for more information.
Unit Set Name field	Displays the name of the selected unit set. You can only modify names of the custom unit sets.

The following table contains a list and description of the objects in the Display Units group:

Object	Description
Display Units table	Contains a list of variables and the units associated to the variables. The units associated to the variables changes depending on the unit set selected. You can only modify the units associated to the variables of a custom unit set. Refer to section Change the Unit of a Variable for more information.
View button	Allows you to see the unit conversion of the selected unit from the Display Units table.
Add button	Allows you to add a unit conversion for the selected variable from the Display Units table. You can only add new conversion units for the variable of a custom unit set. Refer to section Adding a Unit Conversion for more information.
Delete button	Allows you to delete a user added unit conversion from a variable of a custom unit set.

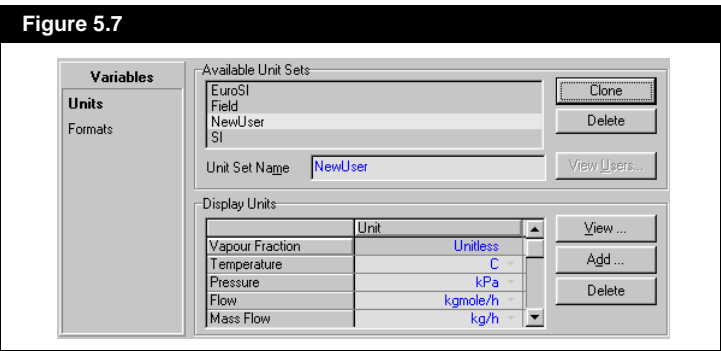
You cannot delete the program's default unit sets.

The program has three default unit sets. The default unit sets are: EuroSI, Field, and SI. These three sets are fixed, in which none of the units associated to the variables can be changed. Since you want to display information in units other than the default, the program allows you to create your own custom unit sets.

Adding a New Unit Set

You can create the new custom unit sets by cloning an existing set and altering it. The procedure is as follows:

1. Select the unit set you want to modify from the Available Unit Sets group.
2. Click the **Clone** button.



The program clones the selected unit set and automatically gives a default name to the new unit set. The default name is **NewUser**.

3. The default name appears in the Available Unit Sets list and in the **Unit Set Name** field. Notice that the text in the **Unit Set Name** field is **blue** in colour, which means you can change the default name.

The units used in the new unit set are the same as the unit set you cloned.

Change the Unit of a Variable

You can not modify the units in any of the three default unit sets: SI, Field, and Euro SI.

With the focus in the appropriate cell, you can also press the **SPACE BAR** to open the drop-down list.

To change the units in a unit set:


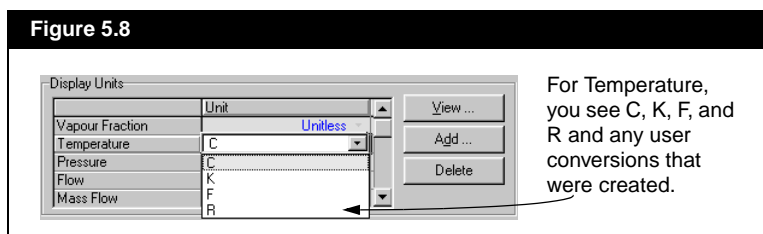
1. From the list of Available Unit Sets, select the unit set you want to use for your simulation.
2. In the Displayed Units group, select the unit of the variable you want to change (e.g., Temperature).
3. With the focus in the Temperature unit cell, click the down arrow  to open a drop-down list. The drop-down list shows all available convertible units for that unit type.

Figure 5.8



This selection does not change the program's internal unit set.

4. From the list, click the unit you want use as your base unit for your simulation.

Deleting a Unit Set

You can not delete the three default unit sets: SI, Field, and Euro SI.

To delete a unit set:

1. Select the unit set you want to delete from the list in the Available Unit Sets group.
2. Click the **Delete** button.

You will not be prompted to confirm the deletion of a unit set, so ensure that you have selected the correct unit set to delete.

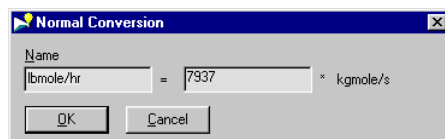
Viewing a Unit Conversion

The program performs its calculations in an internal unit set, and every other unit is converted from these default units. The View button allows you to view the conversion factor that the program uses to convert from its internal unit (SI) to the unit chosen in your unit set. You can view the conversion for any available unit.

To view a unit conversion:

1. From the list of Available Unit Sets, select the unit set you want to use for your simulation.
2. In the Displayed Units group, select the unit for which you want to view the conversion.
3. Click the **View** button to display the Conversion view.

Figure 5.9



The Name field displays the name of the unit. The field next to the Name field displays the conversion factor. Notice the text in the fields are all black, indicating that this is a *View Only* field. You cannot change the contents in any of the fields.

4. Click the **OK** or **Cancel** button to close the view.

Adding a Unit Conversion

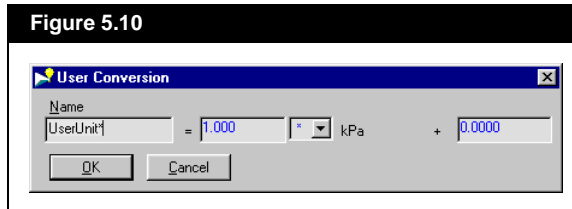
If you require a unit that is not available in the program's database, you can create your own unit and supply a conversion factor. You can only add a unit to a custom unit set.

To add a unit conversion:

1. From the list of Available Unit Sets, select the custom unit set to which you want to add the unit.
2. In the Display Units group, select the unit type you want to add a conversion.
3. Click the **Add** button. The User Conversion view appears as the figure below.

The program's internal unit is always displayed on the User Conversion view.

Figure 5.10



4. By default, the program names the new unit **UserUnit***. You can change this name by entering a new name in the Name field.
5. In the second field (the multiply/divide field), type the conversion factor between your unit and the program's internal unit.
6. From the drop-down list, specify whether you want to multiply or divide by the conversion factor.
7. In the final field (the add/subtract field), type the conversion factor between your unit and the program's internal unit. To add a factor, specify a value in this field. To subtract, place a negative sign in front of the number (e.g., enter -2.0).
8. Click **OK** and the User Conversion view closes with this unit as the active unit for that unit type.

Deleting a Unit Conversion

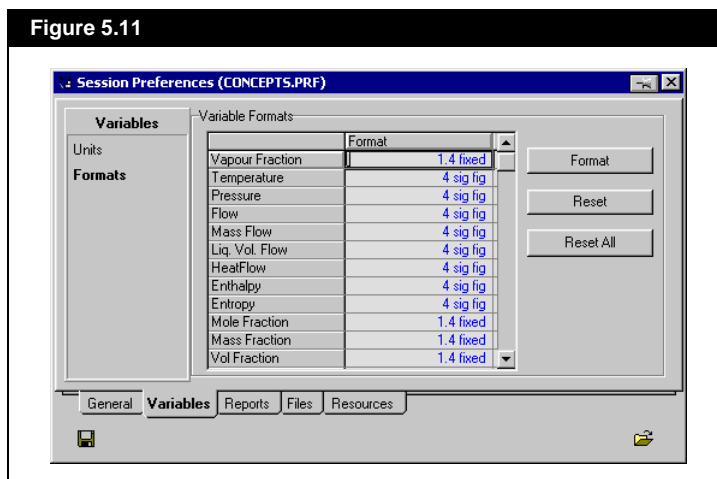
You can only delete user defined unit conversions. To delete a unit conversion:

1. From the list of Available Unit Sets, select the unit set you want to use for your simulation.
2. In the Displayed Units group, select a user-created unit you want to delete.
3. Click the **Delete** button. You will not be prompted to confirm the deletion of the unit. The unit returns to the program's default unit.

Formats Page

On the Formats page you can specify how variable values are displayed.

Figure 5.11



There are three buttons located on the **Formats** page:

You can also open the Real Format Editor view by double-clicking on the format cell of a variable.

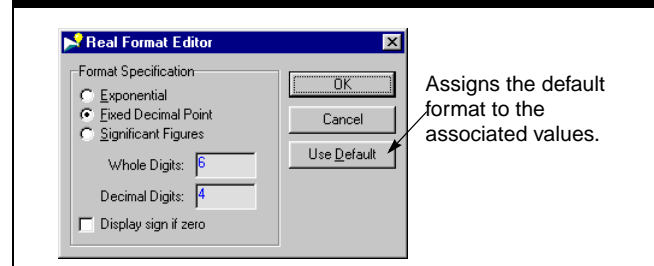
Button	Description
Formats	Allows you to open the Real Format Editor view for the selected variable.
Reset	Allows you to reset the format of the selected variable back to the program's default setting.
Reset All	Allows you to reset all the variable formats back to the program's default setting.

Modifying Variable Formats

To modify the format of a variable:

1. From the list of Variable Formats, click the format cell of the variable to be modified. (To select more than one format at a time, hold down the CTRL key, and click each variable you want to select.)
2. Click the **Format** button to display the Real Format Editor view. The Real Format Editor view varies, depending on which radio button in the Format Specification group is selected.

Figure 5.12



3. Select the format you want to use for your variable.
4. Click the **OK** button to accept the changes and close the view. Click the **Cancel** button to close the view without accepting any changes.

Real Format Editor View

The Real Format Editor view is used to change variables format in the program. The three different formats available are as follows:

Radio Button	Description
Exponential	<p>Displays the values in scientific notation. The number of significant digits appearing after the decimal point is set in the Significant Figure field. As an example:</p> <ul style="list-style-type: none"> Entered or calculated value: 10000.5 Significant Figure: 5 (includes the first whole digit) Final display: 1.0001e+04
Fixed Decimal Point	<p>Displays the values in decimal notation. The number of whole digits and significant digits appearing after the decimal point are set in the Whole Digits and Decimal Digits fields. As an example:</p> <ul style="list-style-type: none"> Entered or calculated value: 100.5 Specify whole digits: 3 Specify decimal digits: 2 Final display: 100.50 <p>If the entered or calculated value exceeds the specified whole digits, the program will display the value as an Exponential, with the sum of the specified whole and decimal digits being the number of significant figures.</p> <p>If the Display sign if zero checkbox is checked, the program will display the sign of the number entered or calculated that has been rounded to zero.</p>
Significant Figures	<p>Displays the values in either decimal notation and scientific notation. The number of significant digits appearing after the decimal point is set in the Significant Figure field.</p> <p>Example 1:</p> <ul style="list-style-type: none"> Entered or calculated value: 100.5 Significant Figure: 5 Final display: 100.50 <p>Example 2:</p> <ul style="list-style-type: none"> Entered or calculated value: 10000.5 Significant Figure: 5 Final display: 1.0001e+04

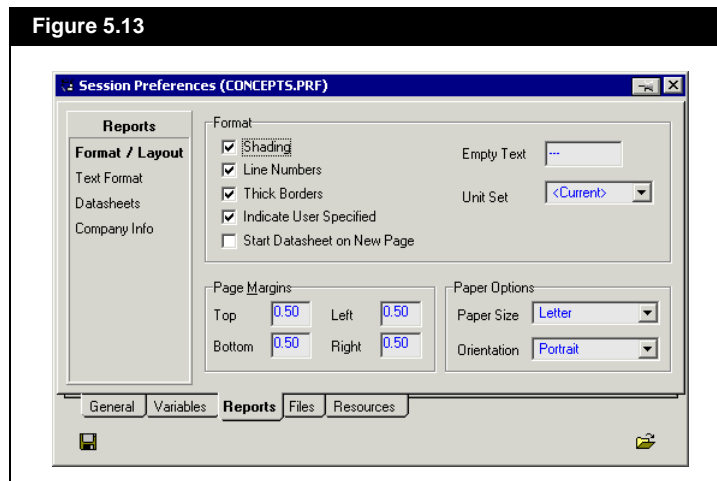
5.4.3 Reports Tab

The Reports tab contains four pages: Format / Layout, Text Format, Datasheets, and Company Info.

Format / Layout Page

The Format / Layout page provides options for formatting and specifying the appearance of your printed reports.

Figure 5.13



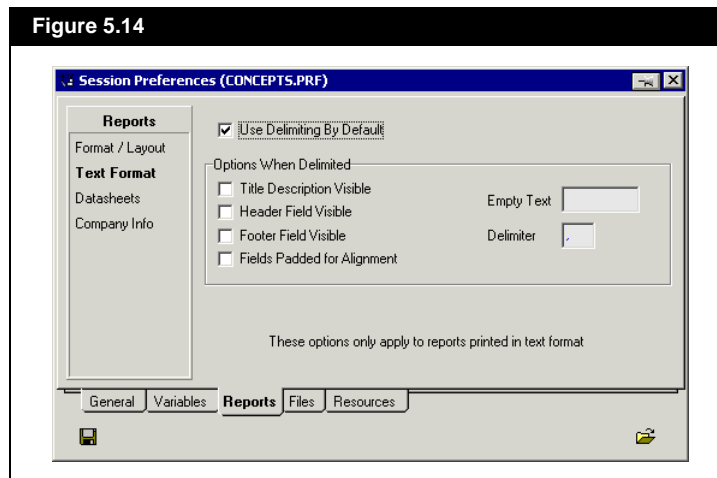
Object	Description
Shading checkbox	When checked, headers, footers, and titles are shaded.
Line Numbers checkbox	When checked, line numbers are on the left side of the report.
Thick Borders checkbox	When checked, report border lines are thicker than the other lines in the report.
Indicate User Specified checkbox	When checked, any user specified values in the Datasheet are indicated with an asterisk (*).
Start Datasheet on New Page checkbox	When checked, each Datasheet starts on a new page.
Empty Text field	Specify what you want to display in the Datasheet when there is no value available. The default text is "---".
Unit Set drop-down list	Select the unit set you want your Datasheet to use. This gives you the option of printing Datasheets with different unit sets than your case. For example, your case may be in SI, but you require your report to be in Field units.

Object	Description
Page Margins group	Set the margins of your page. The values are the distance in inches from the edge of the page.
Paper Size drop-down list	Select the size of paper you want to print on. The list contains all of the Microsoft defaults.
Orientation drop-down list	Select the orientation of the data on the paper. You have two options: Portrait or Landscape.

Text Format Page

For reports printed in text format, the Text Format page allows you to specify some text formatting options.

Figure 5.14



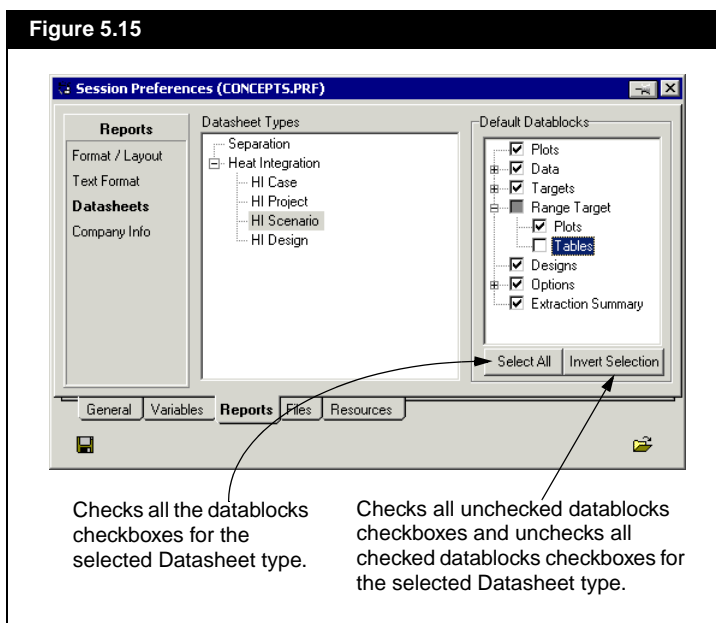
Object	Description
Use Delimiting By Default checkbox	Check this checkbox if you want the text file to always be delimited.
Title Description Visible checkbox	When checked, a title is added to the text file. The title includes the name of the object and the tabs that are included in the report.
Header Field Visible checkbox	When checked, a header is added to the text file. The header includes the company information and the date the report was created.
Footer Field Visible checkbox	When checked, a footer is added to the text file. The footer includes the program version and build number.
Fields Padded for Alignment checkbox	When checked, spaces are added between each field to align the fields.

Object	Description
Empty Text field	Specify what you want to display in the Datasheet when there is no value available. The default text is blank.
Delimiter field	Specify what you want to use as the delimiter in your text file. The default text is comma delimited (.).

Datasheets Page

The Datasheets page allows you to select which datablocks are to be included for each stream, unit operation, utility, and reaction report printout.

Figure 5.15



Modifying Datasheets

To modify the datasheets:

1. Select the datasheet type in the Datasheet Types tree.
2. Select the datablocks to be included or excluded in the Default Datablocks group.

Click on the "+" or "-" icons to expand or shrink the branches.

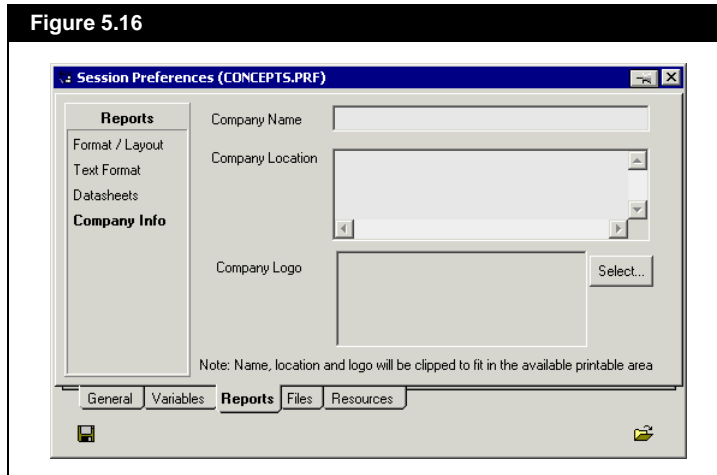
Company Info Page

The program does not automatically resize a bitmap file to fit the logo box on this page.

The maximum logo size that can be accommodated by the logo box is 6.55 cm wide by 2.38 cm high.

On the Company Info page, you can provide some information about your company, such as the company name, location, and logo.

Figure 5.16



To modify the company information:

1. In the Company Name field, type the company name that you want to display in the report header.
2. In the Company Location text editor, type the company location that you want to display in the report header.
3. To add a company logo, click the **Select** button. The Select Bitmap on Disk view appears. Browse to the location of your bitmap file (*.bmp).
4. Select the file you want to import and click the **Open** button.

The logo picture has to be in bitmap format.

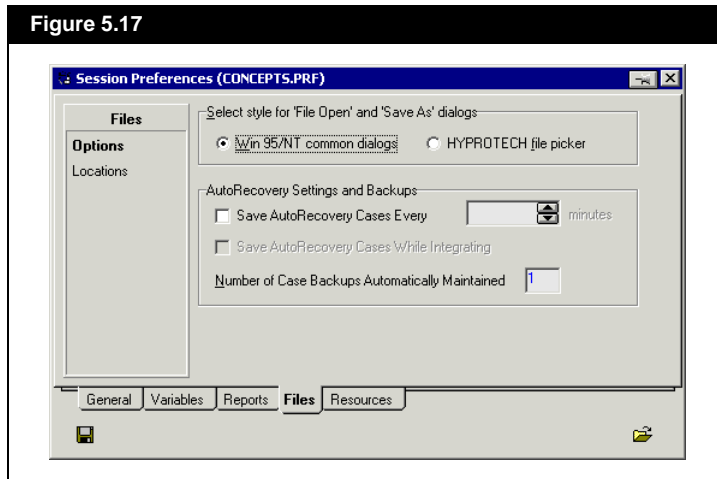
5.4.4 Files Tab

The Files tab contains two pages: Options and Locations.

Options Page

The Options page allows you to modify the preferences used when saving or opening a case.

Figure 5.17



From the Select style for 'File Open' and 'Save As' dialogs group, click either the Win 95/NT common dialogs or the HYPROTECH file picker radio button. The HYPROTECH file picker displays custom The program's open and save views that show the build in which the case was saved, and the case description (if one was added).

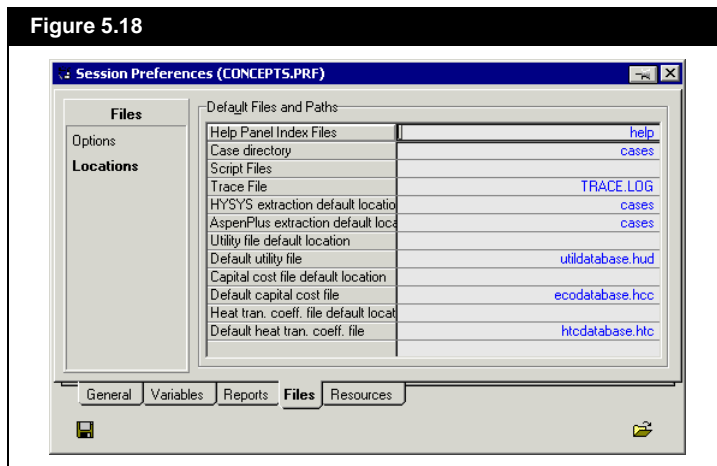
In the AutoRecovery Settings and Backups group, use the checkboxes to select the options you want to use. The following options are available:

Object	Description
Save AutoRecovery Cases Every	When checked, the program saves an auto recovery case every specified amount of time. Use the minutes field to specify the amount of time between every save. You can use the up and down arrows to increase and decrease the value of the field by one with each click, or you can enter a value directly in the field.
Save AutoRecovery Case While Integrating checkbox	When checked, the program saves an auto recovery case every time the integrator is run. This checkbox is only available when the Save AutoRecovery Cases Every checkbox is checked.
Number of Case Backups Automatically Maintained field	This field is used in conjunction with the Number of Case Backups Automatically Maintained. When the field is specified with a number, the program maintains the specified number of backups of each simulation, using the extension bk*. The newest backup is bk0, the next newest bk1, etc.

Locations Page

On the Locations page, you can select and specify the default paths for saving and reading case files.

Figure 5.18



For example, the program is set to look in the Cases folder for any case files because the Case directory field contains the path “cases”. Leave the field blank if you do not want to use a default location for that option.

There are several important files whose default location is defined here: COMThermo Fluid Package, Heat Transfer Coefficient database, Utilities database, and Capital Cost index database. It is very important to note that these default files and their default file location will be used if no other file is specified or the file specified cannot be located.

Changing Component Databases

The program allows you to read component data from seven databases.

- Hyprotech (default database provided with the program)
- API database
- DIPPR database
- PPDS database
- DDB database
- HYSIM user database
- PPD HYSIM database

To change the component database:

1. Select **Tools-Preferences** command from the menu bar to open the Session Preferences view.
2. Click the **Files** tab and go to the **Locations** page.
3. Beside the PPDS database display cell, enter the names of the database files to be used and their locations.
4. Close the Session Preferences view, by clicking on the **Close** icon.
5. Open the Fluid Package Manager view by clicking the **Fluid Package Manager** icon.
6. Do one of the following:
 - Select the fluid package from the Available Fluid Packages list and click the **Edit Fluid Package** icon to open the Fluid Package view.
 - Click the **Add Fluid Package** icon to open the Fluid Package view
7. Go to the **Components** tab in the Fluid Package view, and select the new component database file from the Database drop-down list.



Close icon



Edit Fluid Package icon



Add Fluid Package icon

5.4.5 Resources Tab

The Resources tab contains five pages: Colours, Fonts, Icons, Cursors, and Sounds.

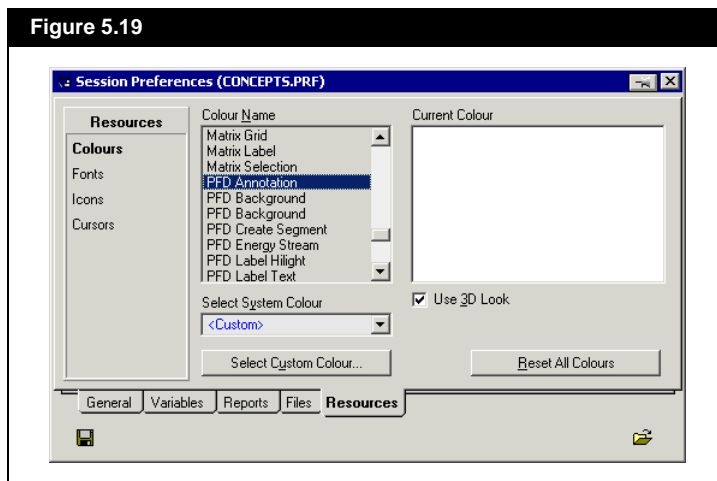
Colours Page

The program's default colour settings for text in cells/fields are as follows:

- Black text indicates the value is calculated by the program and cannot be changed.
- Blue text indicates the value is entered by the user and you can change the value.
- Red text indicates the value is calculated by the program and you can change the value.

All the functions and screen displays in the program are set with a predefined colour scheme. However, you can make changes to this colour set and customize it to meet the specific needs of your simulation.

Figure 5.19



The following table contains a list and description of the objects in the Colours Page view:

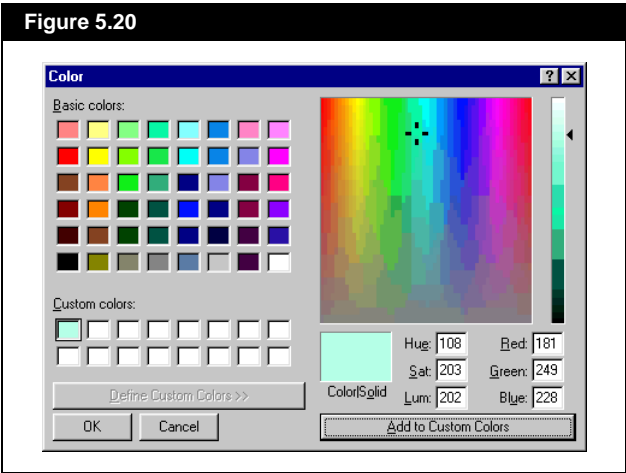
Object	Description
Colour Name list	Contains all the screen elements in the program for which you can change the colour.
Current Colour selector	Displays the current colour for the selected program element in the Colour Name list.
Select System Colour drop-down list	This drop-down list contains the colour system applied to the selected element in the Colour Name list.
Select Custom Colour button	Allows you to open the Colour Palette. The Colour Palette is used to select a different colour or supply a custom colour.

You can double-click in the Current Colour selector to open the Colour Palette.

Object	Description
Use 3D Look checkbox	Check or Uncheck this checkbox to toggle the 3-dimensional appearance of views when using Windows 2000/XP.
Reset All Colours button	Allows you to reset all element colours to the program's default colour scheme.

To change the colour of an element:

1. Select the item from the **Colour Name** list.
2. From the **Select System Colour** drop-down list, select one of the system colours that are available or select **<Custom>**.
3. If you select **<Custom>**, click the **Select Custom Colour** button. The Colour Palette appears.



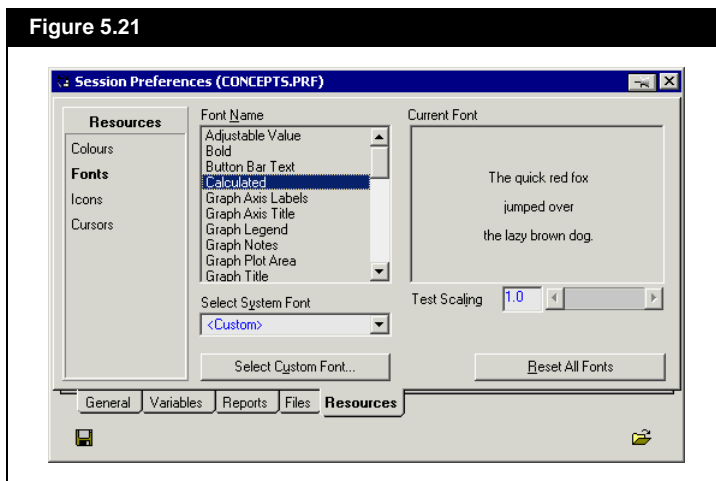
4. Select the colour you want from the Colour Palette or your own customize colour and click the **OK** button.
5. Notice the selected item has changed from the default colour to the new colour you selected. You can continue to change whatever item colours you want.

If you change any colour settings and then want to return to the default program colours, click the Reset All Colours button.

Fonts Page

All the text appearing in the program has a predefined font scheme. However, like the colour scheme, you are able to change the font scheme. The structure of the Fonts page is much like the Colours page, as shown in the figure below.

Figure 5.21



The following table contains a list and description of the objects on the Fonts page:

Object	Description
Font Name list	Contains all the text items in Concept.
Current Font selector	Displays the current font for the selected item in the Font Name list.
Select System Font field	Displays the system font currently applied to the selected font. You can select another system font in the drop-down list.
Select Custom Font button	Allows you to open the Font view. You can also double-click in the Current Font selector to open the Font view.
Test Scaling field	This field is used for scaling the font in the Current Font field. The default display scale value is 1.0. You can change the number value in this field. Increasing the number increases the size of the font, and decreasing the number decreases the font size in the Current Font field.
Reset All Fonts button	Allows you to reset all fonts to the program's default font scheme.

Refer to the [Font View](#) section for more information.

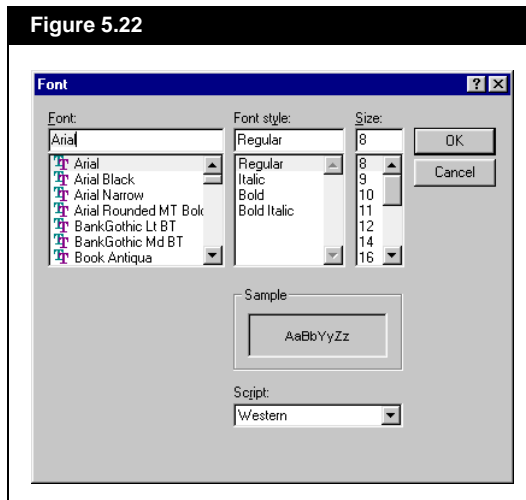
Font View

The Font view allows you to change the font type, style, and size of the selected text item in the Font Name list on the Fonts page.

To change the font for a text item:

1. Select the text item in the Font Name list.
2. From the Select System Font drop-down list, select one of the system fonts that are available or select <Custom>.
3. If you selected <Custom>, click the **Select Custom Font** button. The Font view appears so you can select the font you want.

Figure 5.22

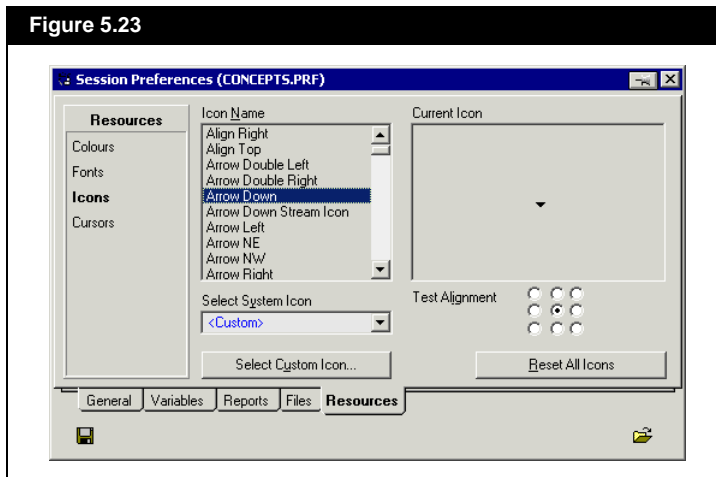


4. Click the **OK** button to return to the Preferences Fonts page. The new font appears in the Current Font field.

Icons Page

The program has a default icon scheme. Any icons in the program that you can change are displayed on the Icons page. The structure of the Icons page is the same as the Colours and Fonts pages.

Figure 5.23



The following table lists and describes the objects on the Icons page:

Object	Description
Icon Name list	Contains all the icons that can be changed in Concept.
Current Icon selector	Displays the current icon for the selected item in the Icon Name list.
Select System Icon field	Displays the icon system applied to the selected item in the Icon Name list. You can change the icon system using the drop-down list.
Select Custom Icon button	Allows you to open the Internal Icon view. You can also double-click on the Current Icon selector to open the Internal Icons view.
Test Alignment radio buttons	Allows you to align the icon. Select the radio button and the icon in the Current Icon field will move according to the radio button selected.
Reset All Icons button	Allows you to reset all Icons to the program's default icon scheme.

Refer to the [Internal Icons View](#) section for more information.

Internal Icons View

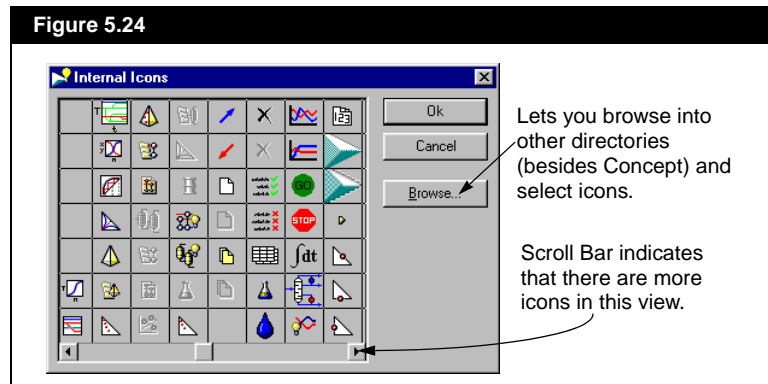
The Internal Icons view allows you to supply a custom icon or select a different icon for the selected icon item in the Icon Name list on the Icons page.

To change an icon:

1. From the list of icon names, select the icon you want to modify.
2. From the Select System Icon drop-down list select one of the system icons that are available or select **<Custom>**.
3. If you selected **<Custom>**, click the **Select Custom Icon** button. The Internal Icons view appears.

The Internal Icons view displays all the icons available in Concept. You can select any of these icons as the icon for an item.

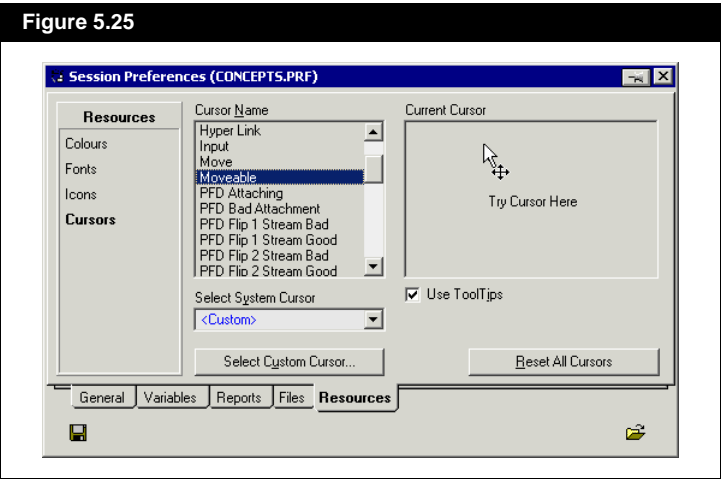
Figure 5.24



4. Scroll through the available icons or click the **Browse** button to find the icon you want. After you have selected the icon you want, click the **OK** button.
The Current Icon field displays the icon you have selected.

Cursors Page

As with the Colours, Fonts, and Icons pages, the program allows you to customize the mouse pointers. Cursors type is often specific to certain functions. Any cursor types that you can change are displayed on the Cursors page.



The following table lists and describes the objects on the Cursors page:

Object	Description
Cursor Name list	Displays all the cursors available in Concept.
Current Cursor selector	Place the mouse pointer on this display field to display the current cursor for the selected item in the Cursor Name list.
Select System Cursor field	Displays the cursor system presently applied to the selected item in the Cursor Name list. You can change the cursor system using the drop-down list.
Select Custom Cursor button	Allows you to open the Internal Cursors view. You can also double-click in the Current Cursor selector to open the Internal Cursors view.
Use Tool Tips checkbox	When checked, certain objects in the view will display the tool tips when the mouse pointer hovers over the object. When unchecking the Use ToolTips checkbox, the Show ToolTips checkbox in the General tab will also be unchecked.
Reset All Cursors button	Allows you to reset all cursors to the program's default cursor scheme.

Refer to the [Internal Cursors View](#) section for more information.

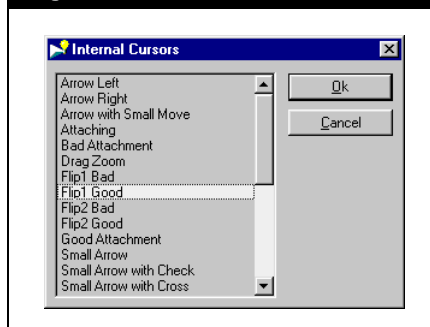
Internal Cursors View

The Internal Cursors view allows you to change the cursor for the selected cursor item in the Cursor Name list on the Cursors page.

To change a cursor:

1. From the list of cursor names, select the cursor you want to modify.
2. From the Select System Cursor drop-down list, select one of the system cursors that are available or select **<Custom>**.
3. If you selected **<Custom>**, click the **Select Custom Cursor** button. The Internal Cursors view appears so you can select the cursor you want.

Figure 5.26



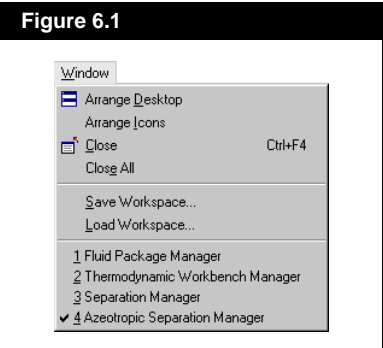
4. After selecting the icon you want from the list on the Internal Cursors view, click the **OK** button. The Current Cursor field will display the cursor you selected, if you placed the mouse pointer over the field.

6 Window & Help Menu Options

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6.1 Window Menu

The Window menu contains general Windows application functions. The options are:



Command	Description
Arrange Desktop	Cascades all views which are currently open and not iconized.
Arrange Icons	Arranges iconized views horizontally at the bottom of the desktop.
Close CTRL+F4	Closes the active view.
Close All	Closes all the views.
Save Workspace	Allows you to save the current desktop layout for future use.
Load Workspace	Allows you to load another case which is currently open. This function lets you toggle between cases.



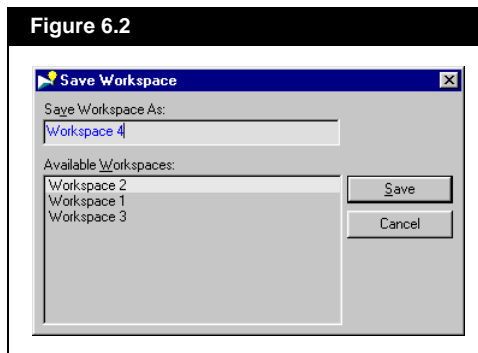
Black checkmark

The last group of commands in this menu is a list of all open views on the desktop. The active view is indicated with a black checkmark.

6.1.1 Save Workspace

You can save different Workspace arrangements within a case. The Workspace is a specific organization of views for the current case. For example, you could create an arrangement of views which has the HI Case, Simple Column, Stream Workbook, Fluid Package Manager, etc. You can name each arrangement individually, then re-access the arrangement at any time.

Figure 6.2



This has no effect on the calculation status. It is simply the way the various views are arranged. After changes have been made to the desktop arrangement, you can then re-load a saved arrangement to re-access the view layout.

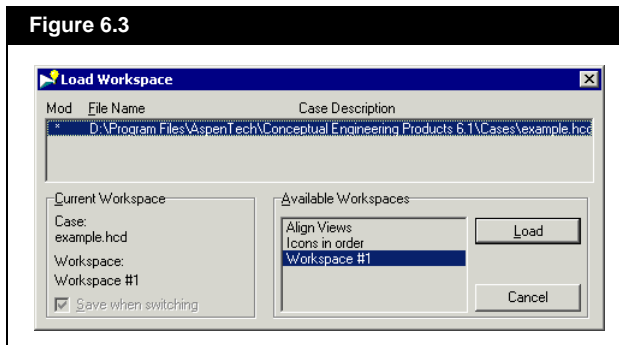
To save a workspace:

1. Click on the **Window** menu.
2. Select the **Save Workspace** command. The Save Workspace view appears.
3. In the Save Workspace As field, enter the name of the workspace.
4. Click the **Save** button.
Click the **Cancel** button to close the Save Workspace view without saving the current workspace.

6.1.2 Load Workspace

The Load Workspace view displays all cases that are currently open. The Workspaces contained within each case appear in the Available Workspaces group.

Figure 6.3



To load a workspace:

1. Click on **Window** menu.
2. Select the **Load Workspace** command. The Load Workspace view appears.
3. From the list of available cases, select the case in which you are currently working.
4. From the list of available workspaces, select the workspace you want to use.
5. Click the **Load** button.
Click the **Cancel** button to close the Load Workspace view without making any changes to the current desktop.

Check the Save when Switching checkbox to save the case when switching between workspaces.

To switch to another open case:

1. Select the **Window-Load Workspace** command from the menu bar. The Load Workspace view appears.
2. From the list of available cases, select the case in which you want to switch.
3. From the list of available workspaces, select the workspace you want to load in the new case.
4. Click the **Load** button.

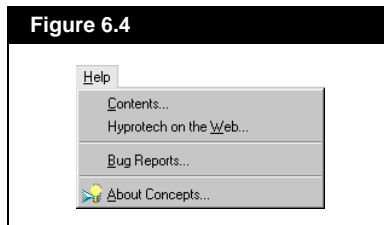
Check the Save when Switching checkbox to save the case when switching between workspaces.

6.2 Help Menu

The Help menu contains commands to help you use the Conceptual Engineering Suite programs. You can access the Help menu by doing one of the following:

- Move mouse pointer over the **Help** menu in the menu bar and click.
- Press **ALT H**.

Figure 6.4



The following commands are available in the Help menu:

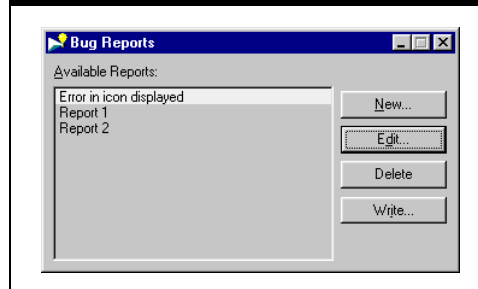
Menu Option	Description
Contents	Displays the online help contents.
Hyprotech on the Web	If there is an internet connection, this command will access Hyprotech's web site using the user's default browser.
Bug Report	Opens the Bug Reports view. This view allows you to log in bugs and inform the program about the bugs.
About	Provides information about the program.

6.2.1 Adding a Bug Report

To add a bug report:

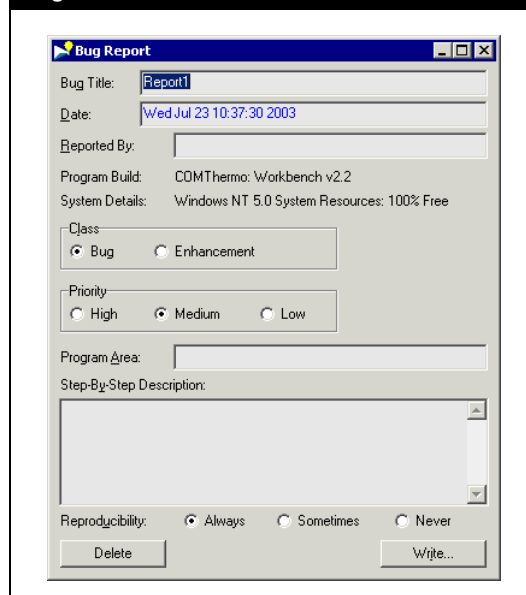
1. Open the **Help** menu and select **Bug Reports** command. The Bug Reports view appears.

Figure 6.5



2. Click the **New** button on the Bug Reports view, to display the Bug Report view.

Figure 6.6



3. In the Bug Title field, type the name of the bug report.

4. The current date and time appear in the Date field, but you can change it if necessary.
5. In the Reported by field, type a contact name so Hyprotech Technical Support can ask further questions or provide answers to the problem.
6. In the Class group, select either the **Bug** or **Enhancement** radio button.
7. In the Priority group, select either the **High**, **Medium** or **Low** radio button.
8. In the Program Area field, enter the area of the program in which the bug is found. For example, if a bug is found on the Plots tab of the Phase Equilibrium view, specify Plots tab - Phase Equilibrium operation. Be as specific as possible so the problem can be located.
9. In the Step-by-Step Description text editor, enter the steps used to produce the bug. Be as specific as possible so the problem can be located and fixed.
10. In the Reproducibility group, click either the **Always**, **Sometimes**, or **Never** radio button.
11. Click the **Write** button to display the Save File view.
12. Specify a name and location for your bug report file.
13. Click the **Save** button.
14. E-mail the bug report file to the AspenTech Support Center at esupport@aspentech.com.

6.2.2 Editing a Bug Report

To edit a bug report:

1. Open the **Help** menu and select **Bug Reports** command. The Bug Reports view appears.
2. From the list of available bug reports, select the bug report you want edit.
3. Click the **Edit** button to display the Bug Report view.
4. From this view, modify any of the parameters making up the bug report.

6.2.3 Deleting a Bug Report

To delete a bug report:

1. Open the **Help** menu and click **Bug Reports**. The Bug Reports view appears.
2. From the list of available bug reports, select the bug report you want delete.
3. Click the **Delete** button.

You will not be prompted to confirm the deletion of a bug report, so ensure the correct report is selected before deleting.

7 Object Inspect Menu

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7.1 Object Inspect Menu

In the program, there are a number of instances in which either the mouse or the keyboard can be used. You can perform many of the tasks and manipulations by using the Object Inspect menu. Place the mouse pointer over the object you want to inspect and right-click to open the Object Inspect menu of the object. Different Object Inspect menus appear depending upon the object selected (i.e., Stream, Plot, Operation, etc.).

7.2 Empty Area in a View

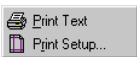


Object Inspect menu

If you right-click an empty space in a view containing a table and tabs or pages, an Object Inspect menu *similar* to the one displayed on the left appears.

Command	Description
Print Datasheet	Lists the available Datasheets for the currently active object. You can highlight a Datasheet and either preview or print it. Refer to Section 3.7 - Print Commands for more details.
Open Page	Opens a new view that displays only the active page information. The Open Page command is not available in all Object Inspect menus.

7.3 Text Editor



Object Inspect menu

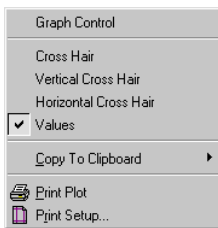
When you right-click in the text editor, the Object Inspect menu displays two commands.

Command	Description
Print Text	Prints the text inside the text area.
Printer Setup	Accesses the typical Windows Print Setup, which allows you to select the printer, the paper orientation, the paper size and paper source.

7.4 Plot Area

When you right-click inside a plot, the type of Object Inspect menu that appears will depend on the number of independent variables the plot displays.

7.4.1 Two Axes Plots



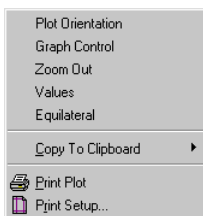
Object Inspect menu

Two Axes plots have two independent variables. The two axes plots in the program include: any plots associated to HI Case and HI Project, Binary Plots, McCabe-Thiele Plots, Omega Plots, and Bifurcation Plots. If you right-click a two axes plot, the Object Inspect menu appears similar to the figure on the left.

The following table lists and describes the commands available on the Object Inspect menu.

Command	Description
Graph Control	Opens the Graph Control view. For more information, refer to Section 8.2 - Graph Control View .
Cross Hair	Toggles the Cross Hair option on or off.
Vertical Cross Hair	Toggles the Vertical Cross Hair option on or off.
Horizontal Cross Hair	Toggles the Horizontal Cross Hair option on or off.
Values	Toggles the Display Values option on or off. For more information, refer to Section 8.3 - Values .
Copy to Clipboard	Copy the entire plot into the clipboard. For more information, refer to Section 8.4 - Copy to Clipboard .
Print Plot	Prints the plot as it appears on the screen. For more information, refer to Section 8.5 - Print Plot .
Printer Setup	Accesses the typical Windows Print Setup, which allows you to select the printer, the paper orientation, the paper size and paper source.

7.4.2 Triangle Plots



Object Inspect menu

Triangle plots have three independent variables. The triangle plots in the program include: Ternary Plots, Component Space Plots, and RCM Plots and Sketches. If you right-click a Component Space plot, the Object Inspect menu appears similar to the figure on the left.

Depending on the plot, none or one of the two following commands may appear above the Plot Orientation command.

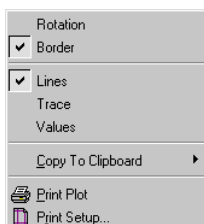
- **Calculate.** Performs all calculations and updates the plot. Available only on RCM Plots.
- **Show Entire Profiles/Show Profiles to Intersection.** Show stripping, rectifying, and intermediate profiles until they reach a pinch point or until they intersect. Available only on Component Space Plots.

The following table lists and describes the rest of the commands available on the Object Inspect menu.

Command	Description
Plot Orientation	Opens the Plot Orientation view. For more information, refer to Section 8.6 - Plot Orientation View .
Graph Control	Opens the Graph Control view. For more information, refer to Section 8.2 - Graph Control View .
Zoom Out	Zooms display out by 25%.
Values	Toggles on or off the fly by displaying pointed curve coordinates. For more information, refer to Section 8.3 - Values .
Equilateral/Right Angle	Toggles the type of triangle plot displayed as Equilateral or Right Angle.
Copy to Clipboard	Copy the entire plot into the clipboard. For more information, refer to Section 8.4 - Copy to Clipboard .
Print Plot	Prints the plot as it appears on the screen. For more information, refer to Section 8.5 - Print Plot .
Printer Setup	Accesses the typical Windows Print Setup, which allows you to select the printer, the paper orientation, the paper size and paper source.

7.4.3 Quaternary Plots

Quaternary plots have four independent variables. A four-component RCM plot in the program is an example of a quaternary plot. If you right-click a quaternary plot, the Object Inspect menu appears similar to the figure on the left.



Object Inspect menu

Command	Description
Rotation	Toggles on or off the rotation control of the plot. When the rotation control is enabled, you can manipulate the angle of the displayed quaternary plot by clicking and dragging the mouse pointer within the plot or pressing the arrow keys.
Border	Toggles on or off the border of the quaternary plot.
Lines	Toggles on or off the residue curves in the quaternary plot.
Trace	Toggles whether the X-Y, Y-Z, and X-Z planes appear near the quaternary plot.
Values	Toggles on or off the fly by displaying pointed curve coordinates. For more information, refer to Section 8.3 - Values .
Copy To Clipboard	Copy the entire plot into the clipboard. For more information, refer to Section 8.4 - Copy to Clipboard .
Print Plot	Prints the plot as it appears on the screen. For more information, refer to Section 8.5 - Print Plot .
Printer Setup	Accesses the typical Windows Print Setup, which allows you to select the printer, the paper orientation, the paper size and paper source.

The commands in the following table apply to the quaternary plot of the Property Table operation:

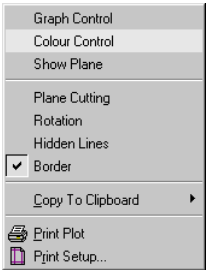


Object Inspect menu

Command	Description
Graph Control	Opens the Graph Control view. For more information, refer to Section 8.2 - Graph Control View .
Colour Control	Opens the Colour Editor view. For more information, refer to the Colour Editor View section.
Show Plane	Opens the View view. The View view contains a binary plot of an active plane cut (indicated by thick black plot line). If there is no active plane cut on the plot, the binary plot appears blank.
Plane Cutting	Toggles on or off the plane cutting option. When the plane cutting option is on, you can cut a plane by clicking and dragging from the edge of the X or Y or Z axis to where you want the plane cut to occur. The active plane cut is indicated by thick black plot line.
Hidden Lines	Toggles between showing or hiding the surface of the plot. When the hidden lines option is on, the surface of the plot is visible. So you cannot see the back lines (back surface) of the plot until you rotate the plot to a different angle.

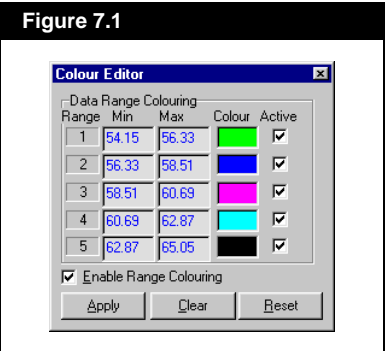
Colour Editor View

The Colour Control command from the Object Inspect menu of the Property Table quaternary plot, opens the Colour Editor view.



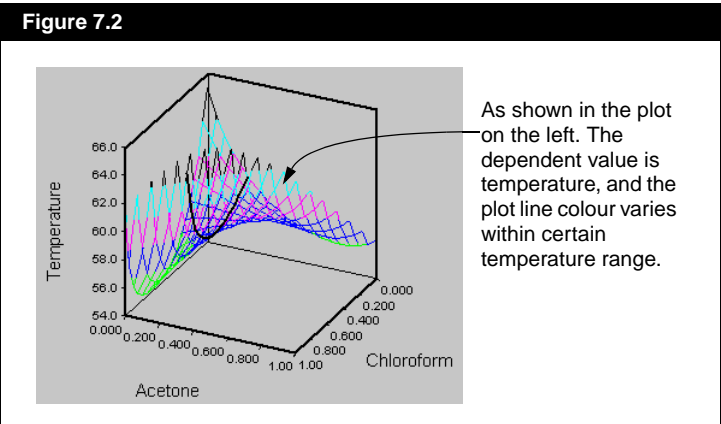
Object Inspect menu

Figure 7.1

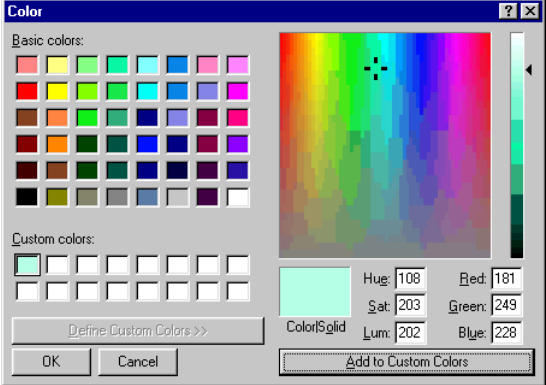


The Colour Editor view contains options to manipulate the colour of the plot lines displayed on the graph. You can select the colour for the dependant variable plot line within a range of values.

Figure 7.2



The following table lists and describes the objects available in the Colour Editor view:

Object	Description
Range cell	Displays the designated number for the different colour range. You can have up to five different colour range.
Min cell	Allows you to specify the minimum value when the selected colour should appear on the plot.
Max cell	Allows you to specify the maximum value when the selected colour should appear on the plot.
Colour cell	<p>Allows you to select the colour that will appear for the selected value range.</p> <p>To change the colour of a value range:</p> <ol style="list-style-type: none"> 1. Double-click in the Colour cell. The Colour Palette appears.  <ol style="list-style-type: none"> 2. Select the colour you want from the Colour Palette or your own customize colour and click the OK button.
Active checkbox	Allows you to toggle on or off the selected colour in the plot for the specified range.
Enable Range Colouring checkbox	<p>Allows you to toggle on or off the different colour of the specified value range.</p> <p>If the checkbox is unchecked, the plot lines on the graph is blue in colour.</p> <p>If the checkbox is checked, the plot lines on the graph displays the colour of the specified value range.</p>
Apply button	Allows you to apply any changes you make on the Colour Editor view to the current plot.
Clear button	Allows you to clear all the options/selections in the Data Range Colouring group.
Reset button	Allows you to reset all the options/selections in the Data Range Colouring group to the program default selections.

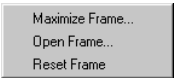
When the checkbox is checked, the selected colour for the specified range appears on the plot line.

When the checkbox is unchecked, the plot line is red in colour for the specified range.

7.5 Project View

In any project view, there are three different panes and two or three different levels. Depending on the level, the pane, and the area on which you right-clicked, the Object Inspect menu will be different.

7.5.1 Viewer Pane



Object Inspect menu

At any level, right-clicking in an empty space in the Viewer pane will open the Object Inspect menu shown on the left. An empty space of a view is defined as any area outside a list, text editor, plot, HEN diagram, or PFD. The following table contains a list and description of the commands in the Object Inspect menu.

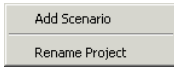
Command	Description
Maximize Frame	Maximizes the selected pane so that it is the only one visible in the project view. When viewing a maximized pane, you can still access the other two panes by clicking and dragging the double border now situated at the pane edges.
Open Frame	Opens a new view that displays only the selected pane.
Reset Frame	Restores the selected pane to default size.

Viewer Group

The Viewer group contains four different Object Inspect menu, depending on the active level and type of operation selected.

You have to right-click within the Viewer group list to access these Object Inspect menus.

Project Level



Object Inspect menu

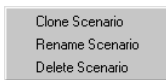
For any operation at the project level, right-clicking in the Viewer group list opens the Object Inspect menu shown on the left. The commands in the menu are described in the table below.

Command	Description
Add a Scenario	Adds a scenario under the selected project level.
Rename Project	Renames the selected project

Scenario Level

There are three operations in the program that uses the project view: Column Sequencing, Azeotropic Column Sequencing, and HI Project.

Azeotropic Column Sequencing & Column Sequencing

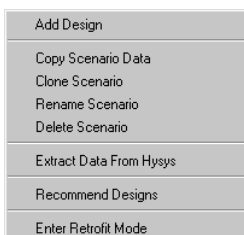


Object Inspect menu

For Azeotropic Column Sequencing and Column Sequencing operations, right-clicking in the Viewer group list opens the Object Inspect menu shown on the left. The commands in the menu are described in the table below.

Command	Description
Clone Scenario	Clones the selected scenario.
Rename Scenario	Renames the selected scenario.
Delete Scenario	Deletes the selected scenario.

HI Project



Object Inspect menu

For the HI Project operation, right-clicking in the Viewer group list opens the Object Inspect menu shown on the left. The commands in the menu are described in the table below.

Command	Description
Add Design	Adds a design under the selected scenario.
Copy Scenario Data	Allows you to select the data that you want to copy to an existing scenario. This is useful in copying only part of the input data to a newly created scenario.

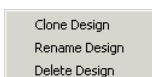
Command	Description
Clone Scenario	Generates a complete copy of the selected scenario.
Delete Scenario	Removes the selected scenario.
Rename Scenario	Rename the selected scenario
Extract Data From HYSYS	Generates heat integration data from an existing case in HYSYS or Aspen Plus. For more information, refer to Chapter 8 - Data Extraction from the Heat Integration manual.
Recommend Design	Automatically generates a heat exchanger network from the scenario information. For more information, refer to Chapter 4 - Heat Integration Project from the Heat Integration manual.
Enter Retrofit Mode	Allows you to take the selected scenario into Retrofit mode. For more information, refer to Chapter 5 - Retrofit Mode Heat Integration manual

Design Level

As mentioned before, there are three operations that uses the project view: Column Sequencing, Azeotropic Column Sequencing, and HI Project.

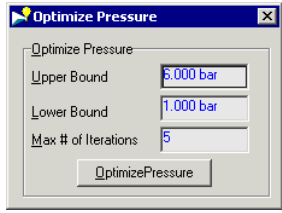
Azeotropic Column Sequencing & Column Sequencing

For Azeotropic Column Sequencing and Column Sequencing operations, right-clicking in the Viewer group list opens the Object Inspect menu shown on the left. The commands in the menu are described in the table below.



Object Inspect menu

Refer to [Section 5.2.3 - Optimising Column Pressure](#) from the **Reference Guide** for more information.

Command	Description
Delete Design	Removes the selected design.
Clone Design	Generates a copy of the selected design
Rename Design	Renames the selected design
Optimize Column Pressures	<p>Opens the Optimize Pressure view.</p>  <p>The Optimize Pressure view allows you to specify the pressure range and the maximum number of iterations for the optimize calculations.</p>

HI Project

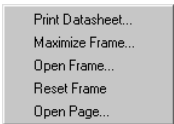


Object Inspect menu

For the HI Project operation, right-clicking in the Viewer group list opens the Object Inspect menu shown on the left. The commands in the menu are described in the table below.

Command	Description
Delete Design	Removes the selected design.
Clone Design	Generates a copy of the selected design
Rename Design	Renames the selected design
Enter Retrofit Mode	Allows you to take the selected scenario into Retrofit mode. For more information, refer to Chapter 5 - Retrofit Mode from the Heat Integration manual

7.5.2 Worksheet Pane



Object Inspect menu
For more information about *pane*, refer to [Section 2.3.5 - Project View](#).

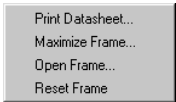
At any level, right-clicking in an empty space in the Worksheet pane of the view will open an Object Inspect menu similar to the one shown on the left. An empty space of a view is defined as any area outside a list, text editor, plot, HEN diagram, or PFD.

The following table describes the commands available for the Worksheet pane Object Inspect menu.

Command	Description
Print Datasheet	Lists the available Datasheets for the currently active object. You can highlight a Datasheet and either preview or print it. Refer to Section 3.7.1 - Printing Datasheet for more details.
Maximize Frame	Maximizes the selected pane so that it is the only one visible in the project view. When viewing a maximized pane, you can still access the other two panes by clicking and dragging the double border now situated at the pane edges.
Open Frame	Opens a new view that displays only the selected pane.
Reset Frame	Restores the selected pane to default size.
Open Page	Opens a new view that displays only the active page/pane information.

At Project level, the command Open Page is not available for the Object Inspect menu.

7.5.3 Main Pane



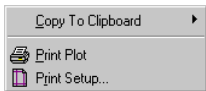
Object Inspect menu

When viewing a maximized pane, you can still access the other two panes by clicking and dragging the double border now situated at the pane edges.

At any level, right-clicking in an empty space in the Main pane of the view will open the Object Inspect menu shown on the left. An empty space of a view is defined as any area outside a list, text editor, plot, HEN diagram, or PFD. The following table contains a list and description of the commands in the Object Inspect menu.

Command	Description
Print Datasheet	Lists the available Datasheets for the currently active object. You can highlight a Datasheet and either preview or print it. Refer to Section 3.7.1 - Printing Datasheet for more details.
Maximize Frame	Maximizes the selected pane so that it is the only one visible in the project view.
Open Frame	Opens a new view that displays only the selected pane.
Reset Frame	Restores the selected pane to default size.

7.6 PFD



Object Inspect menu

The Column Sequencing view displays Process Flow Diagrams (PFD) of various feasible column sequences in the Main pane at the Design level. When you right-click on the PFD, the Object Inspect menu appears similar to the figure on the left.

Command	Description
Copy to Clipboard	Copy the entire PFD view into the clipboard. For more information, refer to Section 8.4 - Copy to Clipboard .
Print Plot	Prints the plot as it appears on the screen. For more information, refer to Section 8.5 - Print Plot
Printer Setup	Accesses the typical Windows Print Setup, which allows you to select the printer, the paper orientation, the paper size and paper source.

7.7 Grid Diagram

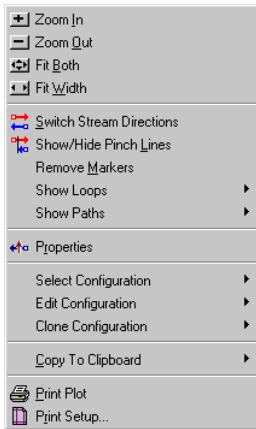
The Grid Diagram and its Object Inspect menus are only available in HX-Net.

The heat exchanger network (HEN) design is graphically displayed in the Grid Diagram. The Grid Diagram is located in different areas for different operation:

- In HI Project operation: the HI Project view, Main pane at the Design level.
- In HI Case operation: the HEN Design view, Grid Diagram tab.

When you right-click the HEN design, the Object Inspect menu appears similar to the figure on the left.

The following table lists and describes the command available in the Object Inspect menu:



Object Inspect menu

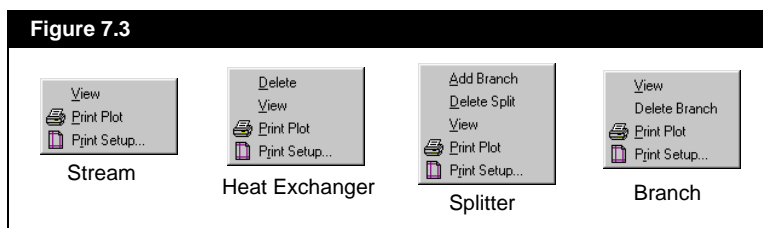
Command	Description
Zoom In	Allows you to zoom in on the HEN design.
Zoom Out	Allows you to zoom out on the HEN design.
Fit Both	Allows you to fit the heat exchanger network on the HEN design in such a way that it fills the entire diagram area.
Fit Width	Allows you to fit the heat exchanger network on the HEN design in such a way that it fills the width of the diagram area.
Switch Stream Direction	Allows you to toggle the direction of hot and cold streams in the HEN design.
Show/Hide Pinch Lines	Allows you to toggle the pinch lines to either be hidden or displayed on the HEN design.
Remove Markers	Allows you to remove any heat exchangers or splitters that have not been completely placed.
Show Loops	Allows you to open a sub-menu that will contain a list of loops, if there is any, in the HEN design. <ul style="list-style-type: none"> • To display a loop, open the sub-menu under the Show Loops command and select the loop you want to display. • To hide the loop, open the sub-menu under the Show Loops command and select the None command.
Show Paths	Allows you to open a sub-menu that will contain a list of paths, if there is any, in the HEN design. <ul style="list-style-type: none"> • To display a path, open the sub-menu under the Show Loops command and select the path you want to display. • To hide the path, open the sub-menu under the Show Loops command and select the None command.
Properties	Allows you to open the Property Preset view.
Select Configuration	Allows you to open the sub-menu that will contain a list of property presets. From the list, you can select a property preset that will change what is displayed on the HEN design. For more information, refer to Section 7.2.11 - Property Presets View from Heat Integration manual.

For more information, refer to [Section 7.2.11 - Property Presets View](#) from **Heat Integration** manual.

Command	Description
Edit Configuration	Allows you to open the sub-menu that will contain a list of property presets. From the list, you can select and edit any of the existing property presets. For more information, refer to Section 7.2.11 - Property Presets View from Heat Integration manual.
Clone Configuration	Allows you to open the sub-menu that will contain a list of property presets. From the list, you can select and clone an existing property preset. For more information, refer to Section 7.2.11 - Property Presets View from Heat Integration manual.
Copy to Clipboard	Allows you to copy the entire HEN design into the clipboard. For more information, refer to Section 8.4 - Copy to Clipboard .
Print Plot	Allows you to print the plot as it appears on the screen. For more information, refer to Section 8.5 - Print Plot .
Print Setup	Allows you to access the typical Windows Print Setup view. This view allows you to select the printer, the paper orientation, the paper size and paper source.

7.7.1 Grid Diagram Objects

The Stream, Heat Exchanger, Splitter, and Branch objects in the HEN design has their own Object Inspect menu. The Object Inspect menu for each object is shown in the figure below.



The following table lists and describes the commands available in the Object Inspect menus.

Command	Description
View	Opens the object view.
Delete	Removes the selected heat exchanger from the Grid Diagram.
Add Branch	Adds another branch into the selected splitter on the Grid Diagram.
Delete Split	Removes the selected splitter and heat exchangers on the selected splitter from the stream on the Grid Diagram.
Delete Branch	Deletes the selected branch on a splitter in the Grid Diagram.

Both View commands from the Splitter and Branch Object Inspect menu opens the Split Editor view.

Command	Description
Print Plot	Prints the heat exchanger network as it appears on the screen. For more information, refer to Section 8.5 - Print Plot .
Print Setup	Accesses the typical Windows Print Setup, which allows you to select the printer, the paper orientation, the paper size and paper source.

7.8 Operation Mode

Refer to [Chapter 3 - Operations Mode](#) from the **Heat Integration** manual for more information about the What If and Trend analysis features.

The HI Case operation has two modes: Design and Operation. In Operation mode there are two features which are not available in Design mode: What If and Trend analysis.

The two operation modes and their Object Inspect menus are only available in HX-Net.


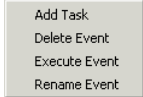

7.8.1 What If Analysis View

Refer to [Section 2.3.5 - Project View](#) for information about project views.

The What If feature allows you access to the What If Analysis view. This view is similar to the project view, except the view only contains two panes: Viewer and Results.

The following table lists and describes the Object Inspect menus available in the Viewer and/or Results pane:

Object Inspect menu	Command	Description
<p>Right-click in any blank area of the Viewer or Results pane to access this menu.</p>	Print Datasheet	Lists the available Datasheets for the currently active object. You can highlight a Datasheet and either preview or print it. Refer to Section 3.7.1 - Printing Datasheet for more details. This command is only available for the Viewer pane.
	Maximize Frame	Maximizes the selected pane so that it is the only one visible in the view. When viewing a maximized pane, you can still access the other two panes by clicking and dragging the double border now situated at the pane's edges.
	Open Frame	Opens a new view that displays only the selected pane/tab.
	Reset Frame	Restores the selected pane to default size.
	Open Page	Opens the selected/active tab in a separate view. This command is only available for the Results pane.

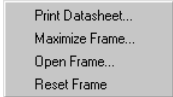
Object Inspect menu	Command	Description
 <p>Select an event type and right-click in the list to access this menu</p>	Add Schedule	Allows you to add an event to the What If analysis. You can have more than one event in the What If analysis.
 <p>Select an event and right-click in the list to access this menu.</p>	Add Task	Allows you to add a task to the selected/active event. You can have more than one task in an event.
	Delete Event	Allows you to delete the selected event.
	Execute Event	Allows you to execute/perform the task(s) within the selected event.
	Rename Event	Allows you to rename the selected event.
 <p>Select a task and right-click in the list to access this menu.</p>	Delete Task	Allows you to delete the selected task.

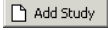
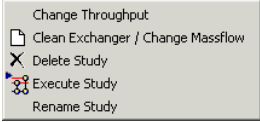

7.8.2 Trend Analysis View

Refer to [Section 2.3.5 - Project View](#) for information about project views.

The Trend feature allows you access to the Trend Analysis view. This view is similar to the project view, except the view only contains two panes: Viewer and Results.

The following table lists and describes the Object Inspect menus available in the Viewer and/or Results pane:

Object Inspect menu	Command	Description
 <p>Right-click in any blank area of the Viewer or Results pane to access this menu.</p>	Print Datasheet	Lists the available Datasheets for the currently active object. You can highlight a Datasheet and either preview or print it. Refer to Section 3.7.1 - Printing Datasheet for more details. This command is only available for the Viewer pane.
	Maximize Frame	Maximizes the selected pane so that it is the only one visible in the view. When viewing a maximized pane, you can still access the other two panes by clicking and dragging the double border now situated at the pane's edges.
	Open Frame	Opens a new view that displays only the selected pane/tab.
	Reset Frame	Restores the selected pane to default size.

Object Inspect menu	Command	Description
 <p>Select the summary level and right-click in the list to access this menu</p>	Add Study	Allows you to add a study to the Trend analysis. You can have more than one study in the Trend analysis.
 <p>Select a study and right-click in the list to access this menu.</p>	Change Throughput	Allows you to change the flow rate of all the streams simultaneously.
	Clean Exchanger / Change Massflow	Allows you to add an event (cleaning a heat exchanger or change the mass flow rate of a stream) to the selected study. You can have more than one event in a study.
	Delete Study	Allows you to delete the selected study.
	Execute Study	Allows you to execute/perform the event(s) within the selected study.
	Rename Study	Allows you to rename the selected study.
 <p>Select an event and right-click in the list to access this menu.</p>	Delete Event	Allows you to delete the selected event.

8 Plot Properties

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8.1 Introduction

Many properties and results in this software can be viewed in graphical form. In order to customize your plot:

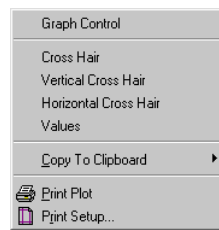
To access the Object Inspect menu:

1. Placed cursor over plot view.
2. Click the right mouse button.

1. Right-click the plot area and the **Object Inspect** menu appears.

The **Object Inspect** menu shown in the figure below belongs to a two-axes plot. If a plot has three- or four-axes, than the commands in the **Object Inspect** menu will vary.

Figure 8.1

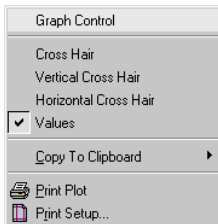


2. Move the mouse pointer over the command you want to execute.
3. Click the highlighted command to select/execute the command you want to use to manipulate the plot.

The following commands are common for most plots:

- Graph Control
- Values
- Copy to Clipboard
- Print Plot
- Print Setup

8.2 Graph Control View



The Graph Control command in the Object Inspect menu, opens the Graph Control view. The Graph Control view contains most of the options that allows you to modify the selected/active plot.

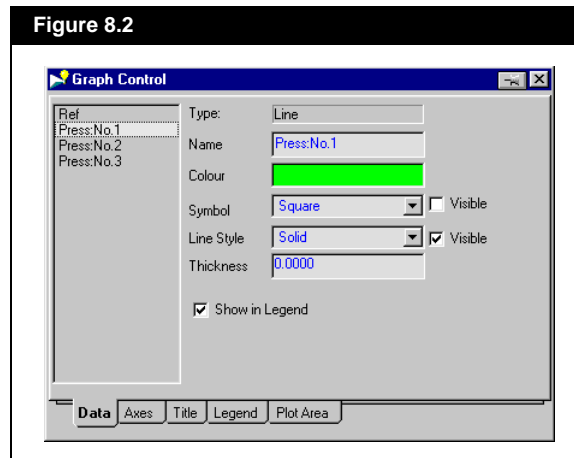
All changes made in the Graph Control view instantaneously affect the plot. There is no need to close the Graph Control view to see the modifications.

The Graph Control view is a modal view by default. To see the changes made to the plot, you can:

- Move the Graph Control view, so you can see the plot view.
- Change the Graph Control view to non-modal view, and access the plot view.

The figure below displays the Graph Control view that you will see if you open the Graph Control view of a two-axes plot

Figure 8.2



You can also open a specific tab on the Graph Control view. By double-clicking in the plot area, you make the plot the active view. Then, either double-click on the plot title or on the legend to access the corresponding tabs in the Graph Control view.

While the plot area has focus, you can also click and drag on either the legend or title to reposition the selected item.

The changes made to a plot using the Graph Control view are specific to the active plot. To make global changes, which will affect all plots, use the Colours and Fonts pages on the Resources tab of the Session Preferences view.

The options use to modify many of the plot characteristics, are categorized into the five tabs in the Graph Control view: Data, Axes, Title, Legend, and Plot Area

8.2.1 Data Tab

For each data set on the plot, you can:

- View the data set Type.
- Modify the data set Name.
- Specify the Colour and Symbol that represent the data on the plot.
- Choose a Line Style.
- Show/hide the Symbol or Line.
- Show/hide the name in the Legend.

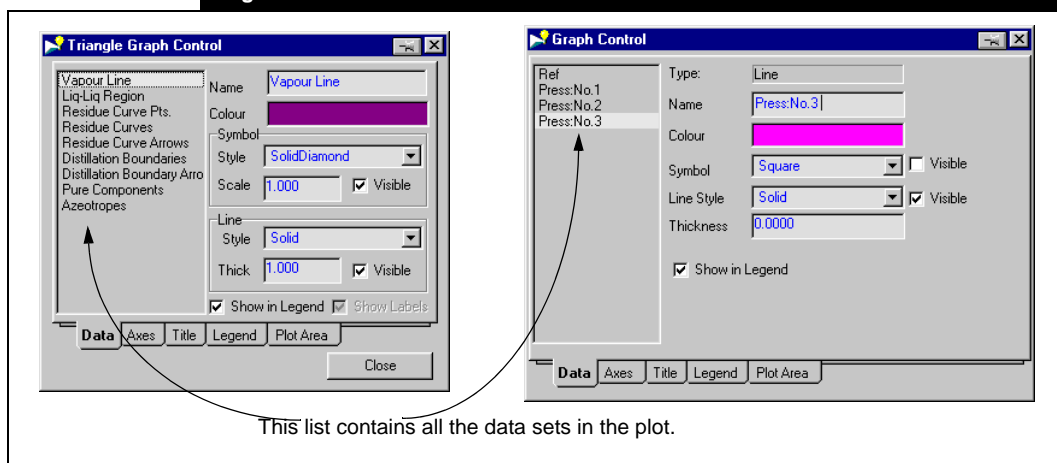
Any changes that are made affect only the data set that is selected in the list.

To make modifications to the appearance of a data set:

1. Select the name of the data set from the list located at the left side of the **Data** tab.
2. The information which corresponds to the selected data set appears in the fields, as shown in Figure 8.3.

The figure on the right is the Graph Control view of a two-axes plot. The figure on the left is the Graph Control view of a three-axes plot.

Figure 8.3



The following table lists and describes the objects in the Data tab view for both type of plots:

Object	Description
Type Display field	The program has two types of plot: Line or Bar. This field shows you which type of plot the data set is using. This field is only available for the two-axes plot.
Name field	The name associated with the data set can be changed in this field. Changes made to the text in this field are reflected in the list of data sets and in the legend.
Colour selector	Allows you to change the colour associated to the selected data set. To change the colour of the data set: 1. Double-click in the selector to open the Colour Palette. 2. Select a colour from the default colour and click the OK button. or 3. Customize a colour by clicking the Define Custom Colours button and generating you customized colour. Then select your custom colour and click the OK button.
Symbol drop-down list	For two-axes plot, the Symbol drop-down list allows you to select the type of symbol you want associated to your data set. To display the symbols along the plot line of the data set, you have to check the Visible checkbox. To hide the symbols, uncheck the Visible checkbox.
Symbol group	For three-axes plot, the Symbol group contains the following objects: <ul style="list-style-type: none"> • Style drop-down list. This drop-down list has the same function as the <i>Symbol</i> drop-down list from the two-axes plot. • Scale field. This field allows you to modify the size of the symbol. There are only three sizes available, and they are represented by integer value between 1 to 3. • Visible checkbox. This checkbox has the same function as the Visible checkbox from the two-axes plot.
Line Style drop-down list	For two-axes plot, this drop-down list allows you to select the type of plot line you want associated to your data set. To display the plot line of the data set, you have to check the Visible checkbox. To hide the plot line, uncheck the Visible checkbox.
Thickness field	For two-axes plot, this field allows you to change the thickness of the plot line for the selected data set. Increasing the value in this field, increases the thickness. You can only enter integer values.

The colour of the text in this field is black, this indicates that it is a display field, you cannot change the information in this field.

The Symbol drop-down list is not available if the data set is type Bar.

The lowest thickness setting is 0 and the highest thickness setting is 5.

The Show Label checkbox is only available for single point data on the plot, not for line data.

Refer to [Section 5.4.2 - Variables Tab](#) for information regarding value formatting.

Object	Description
Line group	For three-axes plot, the Line group contains a Style drop-down list, a Thick field, and a Visible checkbox. <ul style="list-style-type: none">• Style drop-down list. This drop-down list has the same function as the <i>Line Style</i> drop-down list from the two-axes plot.• Thick field. This field has the same function as the <i>Thickness</i> field from the two-axes plot.• Visible checkbox. This checkbox has the same function as the Visible checkbox from the two-axes plot.
Show in Legend checkbox	Allows you to toggle between displaying or hiding the data set name and plot line in the Legend.
Show Label checkbox	Allows you to toggle between displaying or hiding the data point value (boiling point temperature) on the plot/graph.

8.2.2 Axes Tab

For each axis on the plot, you can:

- Change the label name, font, and units.
- Show/Hide the label name and/or units.
- Define the axis bounds or use the Auto Scale function.
- Format the axis values.
- Display the plot on a logarithmic axis

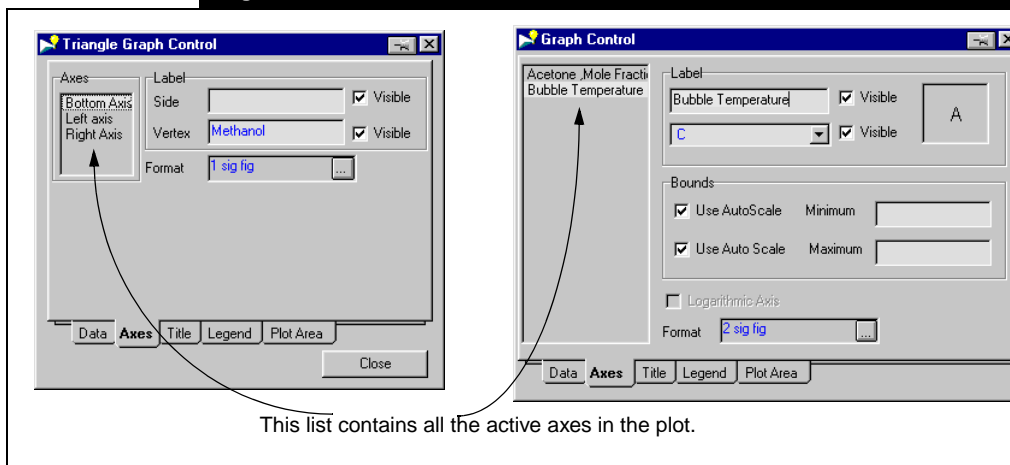
Any changes that are made will affect only the axis that is selected in the list.

To make modifications to the appearance of an axis:

1. Select the name of the axes in the list located at the left side of the **Axes** tab.
2. The information that corresponds to the selected axis appears in the fields, as shown in [Figure 8.4](#).

The figure on the right is the Graph Control view of a two-axes plot. The figure on the left is the Graph Control view of a three-axes plot.

Figure 8.4



The following table lists and describes the objects in the Axes tab for both plots:

Object	Description
Label group for two-axes plot	<p>This group contains the following objects:</p> <ul style="list-style-type: none"> • Label Field. This field allows you to change the label name for the selected axis. To display the label name beside the axis, check the Visible checkbox beside the Label field. To hide the label name, uncheck the Visible checkbox. • Label Drop-down list. This drop-down list contains all the possible units for the selected axis. You can select the units you want the selected axis to display. To display the unit type beside the axis, check the Visible checkbox beside the Label drop-down list. To hide the unit type, uncheck the Visible checkbox. • Label Font Selector. The font selector (located in the right side of the Label group) allows you to customize the font style and font size of the label. Double-click the font selector to open the Font view.
Label group for three-axes plot	<p>This group contains the following objects:</p> <ul style="list-style-type: none"> • Side Field. This field has the same function as the Label field of the two-axes plot. The label appears along the axes. • Vertex Field. This field allows you to modify the name associated with the selected axes. The name appears at the beginning of the axes. To display the name at the beginning of the axis, check the Visible checkbox beside the Label field. To hide the label name, uncheck the Visible checkbox.

The Visible checkbox beside the Label drop-down list is *only available* if the Visible checkbox beside the Label field is checked.

Object	Description
Bounds group	<p>The Bounds group is only available for the two-axes plot. There are two fields and their associated checkbox in this group: Minimum and Maximum.</p> <p>Minimum:</p> <p>There are two ways to set the minimum axis bound value in the Bounds group:</p> <ul style="list-style-type: none"> • Uncheck the Use Auto Scale checkbox beside the Minimum field, and enter the minimum value you want in the Minimum field. • Check the Use Auto Scale checkbox beside the Minimum field to have the program automatically set the minimum bound value. <p>Maximum:</p> <p>There are two ways to set the maximum axis bound value in the Bounds group:</p> <ul style="list-style-type: none"> • Uncheck the Use Auto Scale checkbox beside the Maximum field, and enter the maximum value you want in the Maximum field. • Check the Use Auto Scale checkbox beside the Maximum field to have the program automatically set the maximum bound value.
Logarithmic Axis checkbox	Check this checkbox to display the selected axis on a Logarithmic scale. This checkbox is only available for the two-axes plot.
Format field	This display field allows you to modify the format of the selected axis values. Click the Ellipsis icon beside the Format display field to open Real Format Editor view.



Ellipsis icon

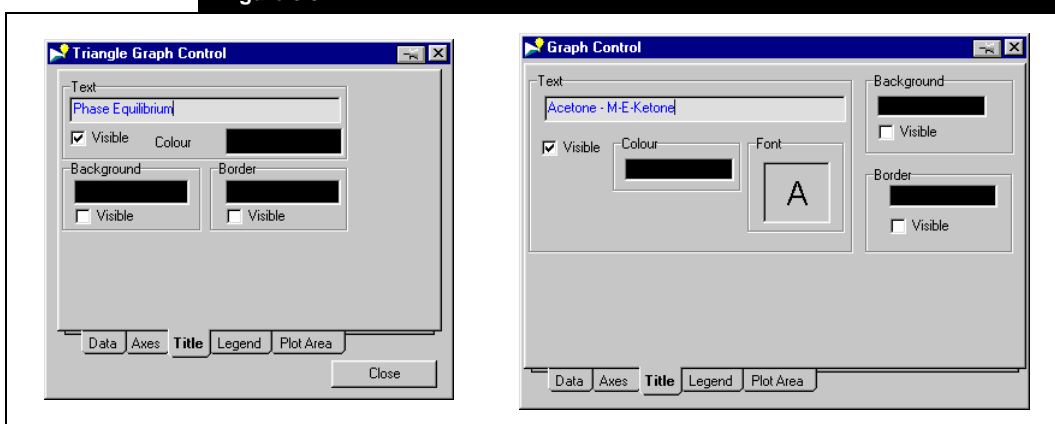
8.2.3 Title Tab

For the title on the plot, you can:

- Change the default title name and font.
- Select the colours for the Text, Background and Border of the title.
- Show/Hide the Title, Background and Border.

The figure on the right is the Graph Control view of a two-axes plot. The figure on the left is the Graph Control view of a three-axes plot.

Figure 8.5



The following table lists and describes the objects on the Title tab for both plots:

Object	Description
Text group	The Text group contains the following objects: <ul style="list-style-type: none"> • Text field. This field allows you to change the title of the plot. • Visible checkbox. Check this checkbox to display the title on the plot. Uncheck this checkbox to hide the title. • Colour selector. This colour selector allows you to change the title font colour.
Font selector	Allows you to customize the font style and font size of the title. Double-click the font selector to open the Font view.

The font selector is only available for the two-axes plot.

Object	Description
Background group	The Background group contains the following objects: <ul style="list-style-type: none">• Background colour selector. This colour selector allows you to change the title background colour.• Visible checkbox. Check this checkbox to display the selected background colour for the title on the plot. Uncheck this checkbox to hide the background colour.
Border group	The Border group contains the following objects: <ul style="list-style-type: none">• Border colour selector. This colour selector allows you to change the title border colour.• Visible checkbox. Check this checkbox to display the border around the title on the plot. Uncheck this checkbox to hide the border.

To change the colour of the title text, title background, or title border:

1. Double-click in the colour selector, of the axes object you want to change, to open the Colour Palette.



2. Select a colour from the default colour and click the **OK** button
- or
3. Customize a colour by clicking the **Define Custom Colours** button, select and add you customized colours to the Custom colours palette. Then select your custom colour and click the **OK** button.

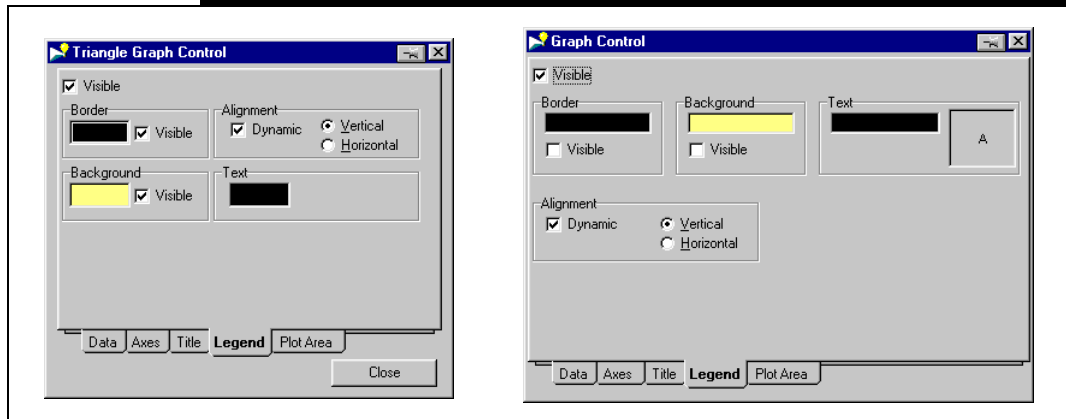
8.2.4 Legend Tab

For the legend on the plot, you can:

- Change the colour of the border, background, or text.
- Change the location of the legend on the plot area.
- Choose the orientation: vertical or horizontal.
- Show/Hide the border and background.
- Enable automatic resizing of the legend upon repositioning.

The figure on the right is the Graph Control view of a two-axes plot. The figure on the left is the Graph Control view of a three-axes plot.

Figure 8.7



The following table lists and describes the objects on the Legend tab:

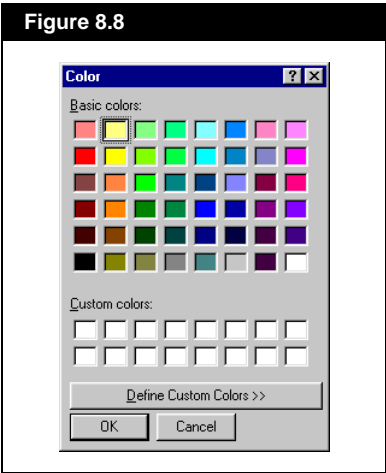
Object	Description
Visible checkbox	Check the Visible checkbox to display the legend on the plot. Uncheck this checkbox to hide the legend.
Border group	The Border group contains the following objects: <ul style="list-style-type: none"> • Border colour selector. This colour selector allows you to change the legend border colour. • Visible checkbox. Check this checkbox to display the border around the legend on the plot. Uncheck this checkbox to hide the border.
Background group	The Background group contains the following objects: <ul style="list-style-type: none"> • Background colour selector. This colour selector allows you to change the legend background colour. • Visible checkbox. Check this checkbox to display the selected background colour for the legend on the plot. Uncheck this checkbox to hide the background colour.

The font selector is only available for the two-axes plot.

Object	Description
Text group	The Text group contains the Text colour selector. This colour selector allows you to change the legend font colour.
Font selector	Allows you to customize the font style and font size in the legend. Double-click the font selector to open the Font view.
Alignment group	<div>The Alignment group contains the following objects:</div> <ul style="list-style-type: none">Dynamic checkbox. Check this checkbox to have the program resize the legend when it is repositioned in the plot area. For example, if the legend is placed near the view side where part of the information is cut off/hidden, the program automatically resizes the legend to display the cut off/hidden information.Vertical and Horizontal radio buttons. The two radio button allows you to set the orientation of the text in the legend. Select a radio button to position the legend information in a row or a column.

To change the colour of the legend text, legend background, or legend border:

1. Double-click in the colour selector, of the axes object you want to change, to open the Colour Palette.



2. Select a colour from the default colour and click the **OK** button

or

Customize a colour by clicking the **Define Custom Colours** button, select and add you customized colours to the Custom Colours palette. Then select your custom colour and click the **OK** button.

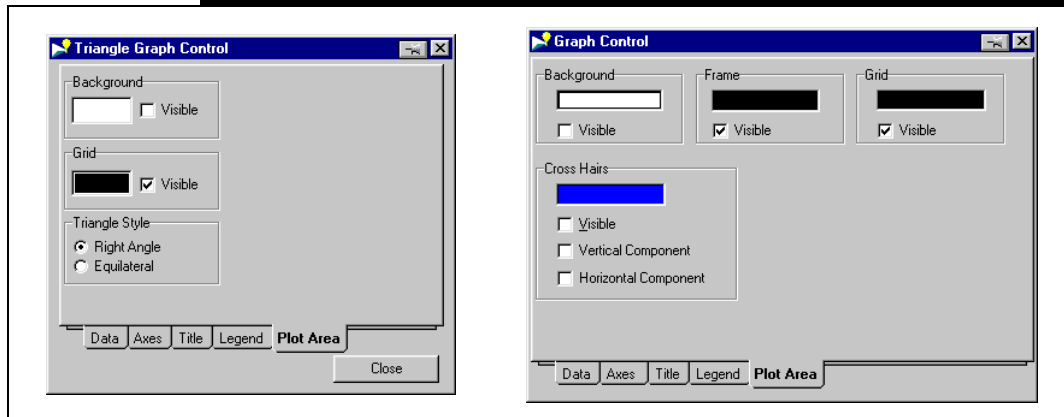
8.2.5 Plot Area Tab

For the area/background of the plot, you can:

- Change the colour of the Background, Frame, or Grid.
- Show/Hide the Background, Frame, or Grid.
- Change the colour of the Cross Hairs
- Show/Hide the Cross Hairs, or choose to display only the vertical or horizontal components.

The figure on the right is the Graph Control view of a two-axes plot. The figure on the left is the Graph Control view of a three-axes plot.

Figure 8.9

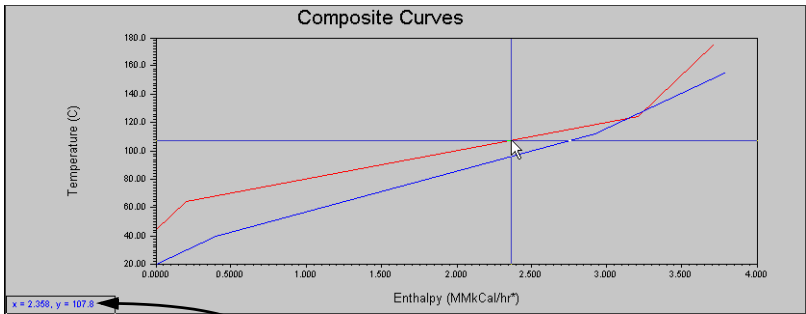


The following table lists and describes the objects on the Plot Area tab for both plots:

Object	Description
Background group	<p>The Background group contains the following objects:</p> <ul style="list-style-type: none"> • Background colour selector. This colour selector allows you to change the plot background colour. • Visible checkbox. Check this checkbox to display the selected background colour on the plot. Uncheck this checkbox to hide the background colour.
Grid group	<p>The Grid group contains the following objects:</p> <ul style="list-style-type: none"> • Grid colour selector. This colour selector allows you to change the grid colour in the plot. • Visible checkbox. Check this checkbox to display the grid in the plot. Uncheck this checkbox to hide the grid.

The Visible checkbox is automatically checked when either Vertical Component or Horizontal Component checkbox is checked.

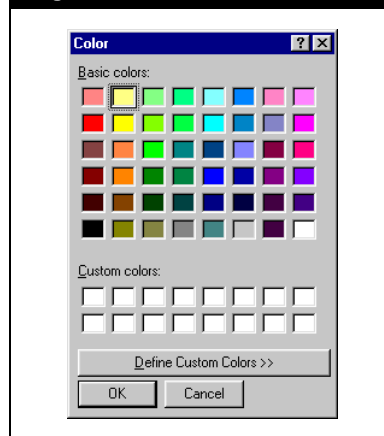
The Visible checkbox is automatically unchecked when both Vertical Component and Horizontal Component checkbox are unchecked.

Object	Description
Frame group	<p>The Frame group is only available for the two-axes plot. This group contains the following objects:</p> <ul style="list-style-type: none"> • Frame colour selector. This colour selector allows you to change the frame colour of the plot. • Visible checkbox. Check this checkbox to display the frame around on the plot. Uncheck this checkbox to hide the frame.
Cross Hairs group	<p>The Cross Hairs group is only available for the two-axes plot. This group contains the following objects:</p> <ul style="list-style-type: none"> • Cross Hairs colour selector. This colour selector allows you to change the cross hair colour on the plot. • Visible checkbox. Check this checkbox to display the cross hair whenever you place the cursor anywhere in the plot area. Uncheck this checkbox to hide the cross hair. • Vertical Component checkbox. Check this checkbox to display the vertical cross hair. Uncheck this checkbox to hide the vertical cross hair. • Horizontal Component checkbox. Check this checkbox to display the horizontal cross hair. Uncheck this checkbox to hide the horizontal cross hair.
	 <p>A display field, that shows the cursor coordinate / axes values, appears at the bottom left corner of the plot view, when the Visible checkbox is checked in the Cross Hairs group.</p>
Triangle Style group	<p>The Triangle Style group is only available for the three-axes plot. This group contains two radio buttons: Right Angle and Equilateral. Display the form of triangle plot you want to see by selecting one of the two radio buttons.</p>

To change the colour of the plot background, plot grid, plot frame, or plot cross hair:

1. Double-click in the colour selector, of the axes object you want to change, to open the Colour Palette.

Figure 8.10



2. Select a colour from the default colour and click the **OK** button

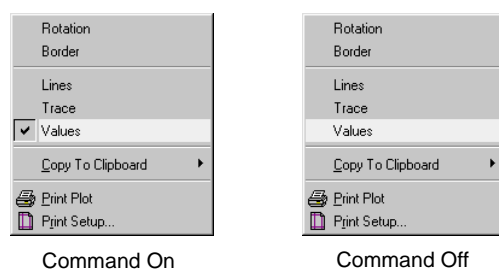
or

Customize a colour by clicking the **Define Custom Colours** button, select and add you customized colours to the Custom Colours palette. Then select your custom colour and click the **OK** button.

8.3 Values

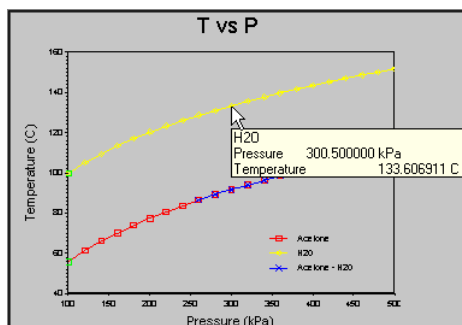
You can toggle the Values command from the Object Inspect menu on or off. A checkmark appears on the left side of the Values command in the Object Inspect menu, when the command is on. The left side of the Values command in the Object Inspect menu is blank, when the command is off. See figure below:

Figure 8.11



When the Values command is on, you can place the cursor on a plotted point in the plot area and a fly by of values (or coordinates) will appear.

Figure 8.12

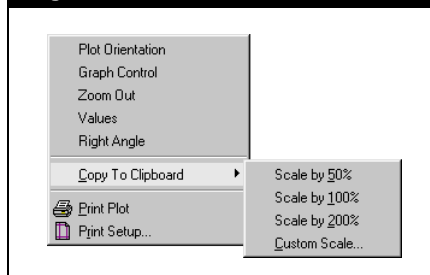


8.4 Copy to Clipboard

Copy the area, plot, or PFD where the Object Inspect menu was accessed, and placed that image into the clipboard. The image can be taken and pasted into other programs as an image file, like a word processor.

The Copy to Clipboard command opens a sub-menu that contains four scale commands, shown in the figure below.

Figure 8.13

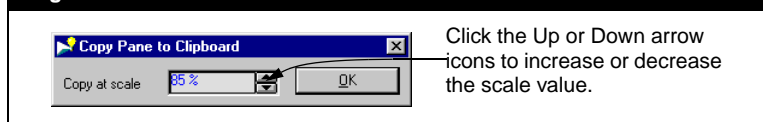


The scale commands let you decide how large an image you want to copy into the clipboard. The four scale commands are: 50%, 100%, 200% and custom scale.

To copy a customize scale of the view/area:

1. Right-click in the area to access the **Object Inspect** menu.
2. Select **Copy To Clipboard** command to open the sub-menu.
3. In the **Copy To Clipboard** sub-menu, select **Custom Scale** command. The Copy Pane to Clipboard view appears.

Figure 8.14



4. Enter the scale you want in the **Copy at scale** field.
5. Click the **OK** button when you are finish, or click the **Close** icon to exit without copying anything to the clipboard.

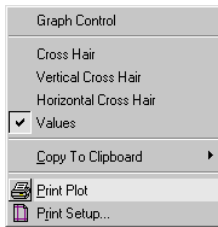


Close icon

8.5 Print Plot

There are two methods to print the plots in the program:

- Right-click the plot area to open the Object Inspect menu. Select the Print Plot command from the Object Inspect menu as shown in the figure below. This method prints only the plot as it appears on the screen.



OR

- Select the plot view you want to print, then click the **File** menu and select the **Print Snapshot** command. This method prints the plot along with everything else in the view that has focus. For more information about printing in general, refer to [Section 3.7 - Print Commands](#).

8.5.1 Print Setup

The Print Setup option accesses the typical Windows Print Setup, which allows you to select the printer, the paper orientation, the paper size, and the paper source. There are two methods to open the Print Setup view:

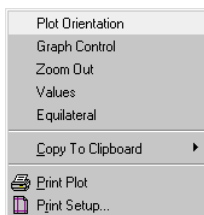
- Right-click the plot area to open the Object Inspect menu. Select the **Print Setup** command from the Object Inspect menu.

or

- Click the **File** menu and select **Print Setup**.

The Print Setup view will vary for different printers.

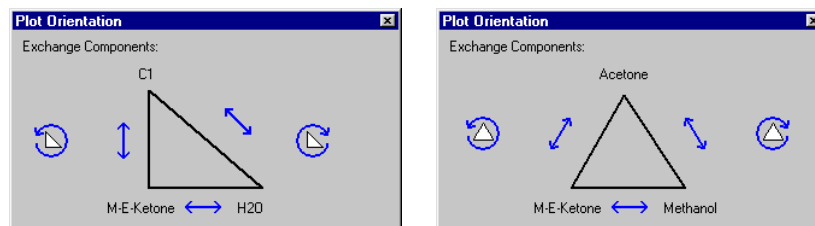
8.6 Plot Orientation View



Object Inspect menu









The Plot Orientation command from the Object Inspect menu opens the Plot Orientation view.

Figure 8.15



Depending on the type of triangle plot, the Plot Orientation view will vary between Right Angle (as shown on the left) and Equilateral (as shown on the right).

The following table lists and describes the icons in the Plot Orientation view:

Icons	Description
 	Allows you to rotate the positions of the variables of the plot by one step counter clockwise.
   	Allows you to switch the position of the two variables between the icon.
 	Allows you to rotate the positions of the variables of the plot by one step clockwise.

9 Fluid Package Manager

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9.1 Introduction

The Fluid Package Manager may or may not be available to you, depending on the license program package you bought.

All necessary information pertaining to flash and physical property calculations is contained within the fluid package. This allows you to define all the required information within a single entity. There are two key advantages to this approach:

- All associated information is defined in a single location, allowing easy creation and modification of the information.
- Multiple fluid packages can be used in the same simulation, however, they are all defined within the Fluid Package Manager.

In the program, most of the operations require a fluid package. Depending on the license that you bought, you may or may not have operations requiring a fluid package. The following is a list of operations that require a fluid package:

- Stream Manager
- Phase Equilibrium
- Property Table
- Pure Component Regression
- Fluid Phase Regression
- Simple Column
- Three Product System
- Complex Column
- Azeotropic Analysis
- Residue Curve Map
- Column Design
- Azeotropic Column Sequencing
- Column Sequencing
- Split Generator

9.2 Fluid Package Manager View

The Fluid Package Manager view allows you to manipulate and organize multiple fluid packages.

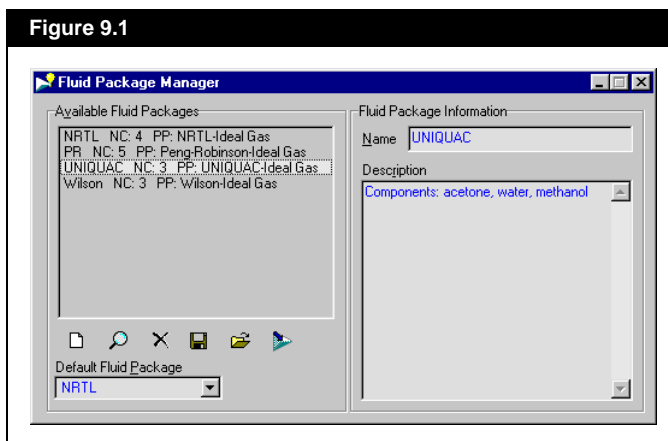
To access the Fluid Package Manager view, do one of the following:

- Click the **Fluid Package Manager** icon in the toolbar.
- From the **Managers** menu, select the **Fluid Package Manager** command.



Fluid Package Manager icon

Figure 9.1



The Fluid Package Manager view is divided into two groups: Available Fluid Packages and Fluid Package Information.







Available Fluid Packages Group

The following table lists and describes the objects available in the Available Fluid Packages group:

When there are no fluid packages in the Available Fluid Packages list, only the Add Fluid Package icon and Import Fluid Package icon are available.

The fluid package can be directly exported only to HYSYS version 3.0 or higher.

If no fluid package is selected as the default, the program automatically selects the first fluid package in the Available Fluid Packages list as the default fluid package.

Object	Icon	Description
Available Fluid Packages list		Contains all the fluid packages available in the current case. The name, number of components, and property package of each fluid package appear in this list.
Add Fluid Package icon		Allows you to create a fluid package. Refer to Section 9.2.1 - Adding a Fluid Package for more information.
Edit Fluid Package icon		Allows you to edit the selected fluid package. Refer to Section 9.2.3 - Editing a Fluid Package for more information.
Delete Fluid Package icon		Allows you to delete the selected fluid package. Refer to Section 9.2.2 - Deleting a Fluid Package for more information.
Export Fluid Package icon		Allows you to export the selected fluid package as an *.ctf file. Refer to Section 9.2.4 - Exporting a Fluid Package for more information.
Import Fluid Package icon		Allows you to import a fluid package. Refer to Section 9.2.5 - Importing a Fluid Package for more information.
Export Fluid Package to HYSYS icon		Allows you to export the selected fluid package directly to a new HYSYS case. Refer to Section 9.2.6 - Exporting Fluid Package to HYSYS for more information.
Default Fluid Package drop-down list		Allows you to designate the default fluid package for the current case. To select a default fluid package, click the down arrow to open the drop-down list, then select the fluid package you want as the default.

Fluid Package Information Group

The Fluid Package Information group contains a field and a text editor:

- **Name field.** Allows you to edit the name of the selected fluid package in the Available Fluid Packages list.
- **Description text editor.** Allows you to enter and store information about the selected fluid package in the Available Fluid Packages list. The information in the Description text editor can also be entered in the **Notes** tab of the Fluid Package view.

9.2.1 Adding a Fluid Package

To add a fluid package:

1. Open the Fluid Package Manager view by clicking the **Fluid Package Manager** icon.
2. Click the **Add Fluid Package** icon in the Available Fluid Packages group. The Fluid Package view appears.

The name of the selected fluid package appears in the title bar of the Fluid Package view and indicates which fluid package you are working on. You can have multiple Fluid Package views open and still know which fluid package you are manipulating.

3. In the Fluid Package view, click the **Property Package** tab and select the property package you want to associate with the fluid package. You can also select components and manipulate the binary coefficients and flash calculations in the Fluid Package view.
4. When you have completed creating the fluid package, close the view by doing one of the following:
 - Press **CTRL F4**.
 - Click the **Close** icon, located at the top right corner.
 - Double-click the **Operation** icon, located at the top left corner.

The new fluid package appears in the Available Fluid Packages group with a default name of Fluid1.

5. You can change the name of the fluid package by entering a new name in the **Name** field of the Fluid Package Information group.



Fluid Package Manager icon



Add Fluid Package icon

Refer to [Section 9.3 - Fluid Package View](#) for more information.



Close icon



Operation icon

9.2.2 Deleting a Fluid Package



Fluid Package Manager icon

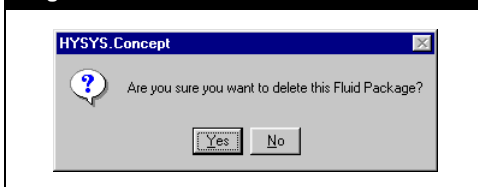


Delete Fluid Package icon

To delete a fluid package:

1. Open the Fluid Package Manager view by clicking the **Fluid Package Manager** icon.
2. Select the fluid package you want to delete from the list in the Available Fluid Packages group.
3. Click the **Delete Fluid Package** icon in the Available Fluid Packages group. The program will prompt you to confirm that you want to delete the fluid package.

Figure 9.2



4. Click the **Yes** button.
If the deleted fluid package was the default fluid package, the program automatically selects the top first fluid package in the Available Fluid Packages list as the new default fluid package.

9.2.3 Editing a Fluid Package

To edit a fluid package:

1. Open the Fluid Package Manager view by clicking the **Fluid Package Manager** icon.
2. From the Available Fluid Packages group list, select the fluid package you want to edit.
3. Click the **Edit Fluid Package** icon. The Fluid Package view for the selected fluid package appears.

The name of the selected fluid package appears in the title bar of the Fluid Package view and indicates which fluid package you are working on. You can have multiple Fluid Package views open and still know which fluid package you are manipulating.



Fluid Package Manager icon



Edit Fluid Package icon

Refer to [Section 9.3 - Fluid Package View](#) for more information.



Close icon



Operation icon

4. Edit the fluid package using the options available on the various tabs in the Fluid Package view.
5. When you have completed editing the fluid package, close the view by doing one of the following:
 - Press **CTRL F4**.
 - Click the **Close** icon, located at the top right corner.
 - Double-click the **Operation** icon, located at the top left corner.

9.2.4 Exporting a Fluid Package



Fluid Package Manager icon

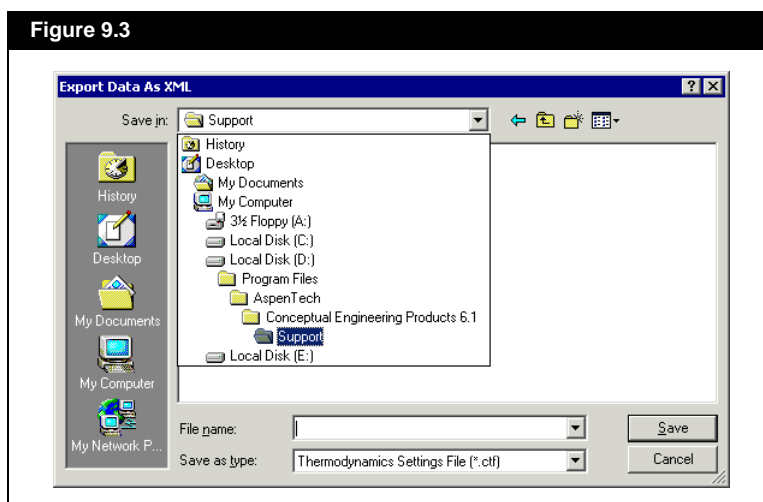



Export Fluid Package icon

To export a fluid package:

1. Open the Fluid Package Manager view by clicking the **Fluid Package Manager** icon.
2. From the Available Fluid Packages group, select the fluid package you want to export.
3. Click the **Export Fluid Package** icon.
The Export Data as XML view appears.

Figure 9.3



4. Click the down arrow  in the **Save in** drop-down list and select where you want to save the exported fluid package.
5. In the **File Name** field, enter a name for the exported fluid package. The program will automatically attach the proper file extension (*.cft).
6. Click the **Save** button.

9.2.5 Importing a Fluid Package

To import a fluid package:

1. Open the Fluid Package Manager view by clicking the **Fluid Package Manager** icon.
2. Click the **Import Fluid Package** icon in the Available Fluid Packages group. The Import Data as XML view appears.

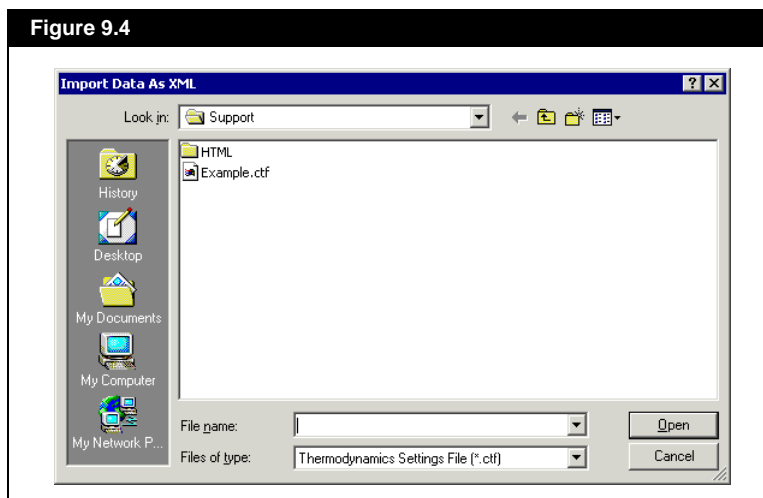


Fluid Package Manager icon



Import Fluid Package icon

Figure 9.4



3. Find and select the fluid package file (*.ctf) you want to import.
4. Click the **Open** button.
The selected fluid package appears in the Fluid Package Manager view with the default name of 'Fluid' followed by a number.

You can change the name of the selected fluid package by entering a new name in the Name field.

9.2.6 Exporting Fluid Package to HYSYS

To export a fluid package to HYSYS version 3.0 or higher:

1. Open the Fluid Package Manager view by clicking the **Fluid Package Manager** icon.
2. From the list in the Available Fluid Packages group, select the fluid package you want to export.
3. Click the **Export Fluid Package to HYSYS** icon.
The HYSYS program will activate and a new case containing the selected fluid package from the program is automatically generated.



Fluid Package Manager icon



Export Fluid Package to HYSYS icon

9.3 Fluid Package View

The Fluid Package view contains all the information/options required to generate a fluid package. To access a Fluid Package view, do one of the following:

- Open the Fluid Package Manager view by clicking the **Fluid Package Manager** icon, then click the **Add Fluid Package** icon.
- Open the Fluid Package Manager view by clicking the **Fluid Package Manager** icon, select the fluid package you want from the Available Fluid Packages list, and click the **Edit Fluid Package** icon.



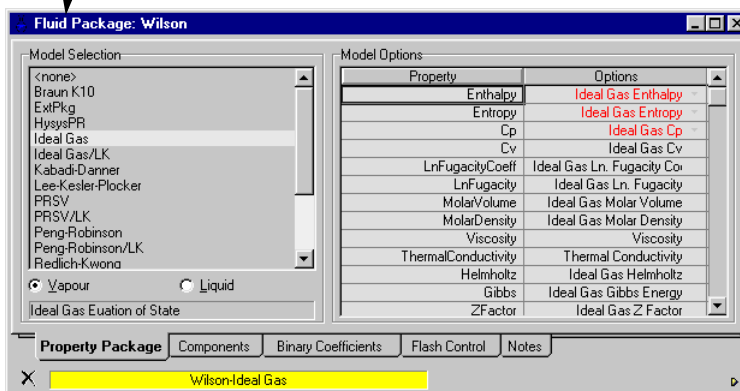
Add Fluid Package icon



Edit Fluid Package icon

Figure 9.5

The name of the selected fluid package appears in the title bar of the view and indicates which fluid package you are working on. You can have multiple Fluid Package view open and still know which fluid package you are manipulating.



The following table lists and describes the objects available in the Fluid Package view:

Object	Description
Property Package tab	This tab allows you to select and manipulate the property package associated with the fluid package.
Components tab	This tab allows you to add or create components associated with the fluid package.
Binary Coefficients tab	This tab allows you to manipulate the binary interaction coefficient values between components in the fluid package.
Flash Control tab	This tab allows you to manipulate the flash calculations performed for the fluid package.



Delete icon



Open Page Tab as Separate Window icon

Object	Description
Notes tab	This tab allows you to enter information about the fluid package.
Delete icon	This icon allows you to delete the fluid package. The program will prompt you to confirm that you want to delete the fluid package.
Status Bar	The status bar displays the selected property package associated with the fluid package.
Open Page Tab as Separate Window icon	This icon allows you to open an active tab as a separate view.

9.3.1 Property Package Tab

The Property Package tab is divided into two groups: Model Selection and Model Options.

Model Selection Group

The Model Selection group allows you to select a fluid phase and a property package for the fluid package. The Model Selection list contains the list of property packages associated with the selected fluid phase.

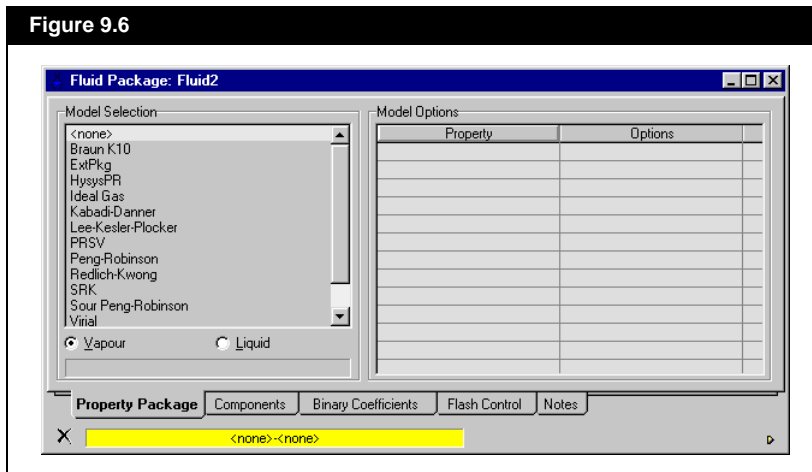
Model Options Group

The Model Options group allows you to manipulate the property package you select. When you select a property package, the Model Options table displays all the properties associated with the selected property package. Some properties can be manipulated by selecting a different option from the drop-down list in the property cell.

Selecting a Property Package

1. Open the Fluid Package view and click the **Property Package** tab.

Figure 9.6



2. In the Model Selection group, select the required phase for the property package by clicking the **Vapour** or **Liquid** radio button.
3. In the Model Selection list, find and select the property package you want to associate with the active phase.

After you select the property package, the Model Options table will be populated with properties for the selected property package.

4. Click the down arrow beside properties with **red** colour text in the Options column to view more options for the selected property.

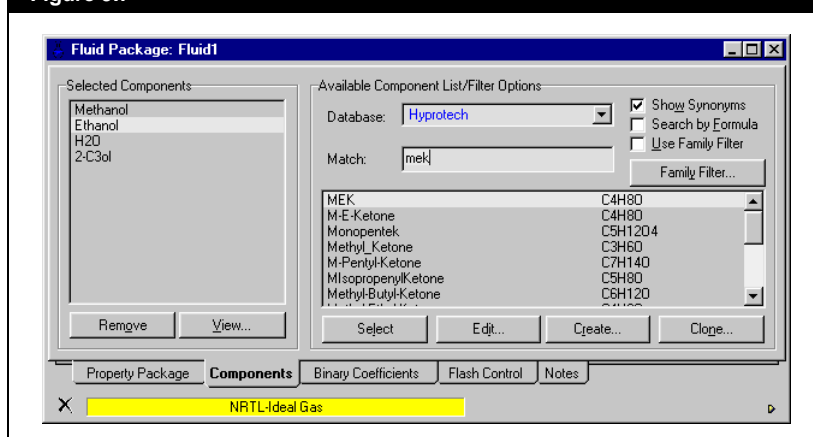
For more information on calculating property options, refer to [Chapter 7 - Property Packages](#) of the COMThermo-Reference Guide.

For more information on selecting property packages, refer to [Section 3.1 - Equations of State](#) and [Section 3.2 - Activity Models](#) of the COMThermo-Reference Guide.

9.3.2 Components Tab

The Components tab allows you to add, remove, edit, create, and clone components for the selected fluid package. You can choose from the components available in the program's component library, or you can create your own hypothetical components.

Figure 9.7



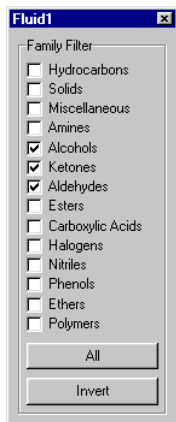
The following table lists and describes the objects in the Components tab:

Object	Description
Selected Components list	Contains the names of the components that have been added to the fluid package.
Remove button	Allows you to remove components from the fluid package. Refer to the Removing Components section for more information.
View button	Allows you to open the Component view(s) of the selected component(s) in the Selected Components list. For more information, refer to Section 9.4 - Component View .
Database drop-down list	Allows you to select a different database file. Each database file contains different amounts and types of components. The default database is Hypotech.
Match field	Allows you to find the components you want by displaying a list of components that matches the text you entered in the Match field.
Show Synonyms checkbox	When checked, the program displays a list of components, including synonym names of the components, based on the text entered in the Match field.

The components appear in ascending numerical and alphabetical order on the list.

Object	Description
Search by Formula checkbox	When checked, the program displays a list of components based on the formula entered in the Match field.
Use Family Filter checkbox	When checked, the program displays a list of components based on the selected component family and the text entered in the Match field.
Family Filter button	Allows you to access the Family Filter view. The Family Filter view contains the families into which the components are grouped. For more information about the Family Filter view, refer to the Adding Components section.
Available Component List/Filter Options list	Displays a list of components depending on the text entered in the Match field, Show Synonyms checkbox, Search by Formula checkbox, and Use Family Filter checkbox. If the Match field is empty, the list displays all the components.
Select button	Allows you to add the selected component from the Available Component List/Filter Options list to the fluid package. Refer to the Adding Components section for more information.
Edit button	Allows you to access the Component view(s) of the selected component(s). For more information, refer to the section Editing Components .
Create button	Allows you to create a hypothetical component. Refer to the Creating Components section for more information.
Clone button	Allows you to clone the selected component(s) from the Available Component List/Filter Options list. Refer to the Cloning Components section for more information.

Adding Components



The All button checks all the checkboxes.

The Invert button checks all the unchecked checkboxes, and unchecks all the checked checkboxes.

To add component(s):

1. Open the Fluid Package view and click the **Components** tab.
2. Search for the components you want from the Available Component List/Filter Options list by doing one or all of the following:
 - Check the **Show Synonyms** checkbox to expand the list to include synonyms.
 - Check the **Search by Formula** checkbox to filter the list by component formula.
 - Check the **Use Family Filter** checkbox to filter the list by component families. Click the **Family Filter** button to open the Family Filter view. In the Family Filter view, check the checkboxes associated with the families you want the list to contain.
 - Enter the name or formula of the component in the **Match** field.
 - Scroll through the list using the scroll bar located at the right side of the list.
3. Select the components you want from the Available Component List/Filter Options list.
4. Click the **Select** button, or double-click the individual component to add it to the fluid package.
The selected components appear in the Selected Components list.

Removing Components

To remove component(s):

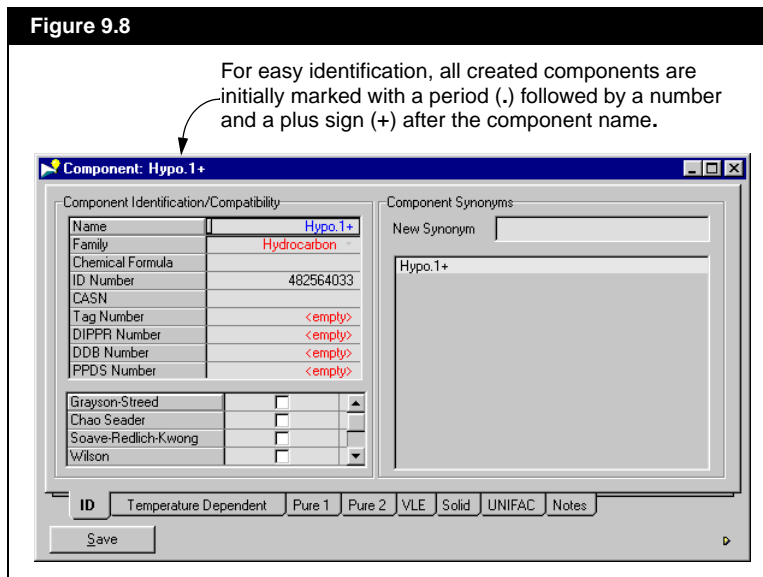
1. Open the Fluid Package view and click the **Components** tab.
2. In the Selected Components group, select the component(s) you want to remove.
3. Click the **Remove** button or press the DELETE key.

Creating Components

To create a component:

1. Open the Fluid Package view and click the **Components** tab.
2. Click the **Create** button in the Available Component List/Filter Options group. The Component view for the created/hypothetical component appears.

Figure 9.8



3. In the **Name** field, enter a name for the new component.
4. Enter all required information for the component in the property data fields.
5. When you are finished entering property data, click the **Pure 1** tab and click the **Estimate** button that appears in the bottom right corner of the view.
6. Save the hypothetical component to the active database by clicking the **Save** button.
7. Click the **Close** icon to close the view.

Refer to the [Estimation Methods for Created Components](#) section for the importance on clicking the Estimate button.



Close icon

Cloning Components

To clone a component:

1. Open the Fluid Package view and click the **Components** tab.
2. Select the component you want to clone from the Available Component List/Filter Options list.
3. Click the **Clone** button. The Component view of the cloned component appears.
4. In the cloned component's view, you can edit the name and properties of the cloned component.
Refer to the [Editing Components](#) section for more information about editing components.

For the purpose of identification, all cloned components are given the original component's name, followed by a period (.), a number, and a plus sign (+).

The following components is treated differently than the rest of the components:

- Water
- Ethylene Glycol
- Triethylene Glycol
- Diethylene Glycol
- Ethanol

If these components are cloned, the cloned components will not have the special treatment.

Editing Components

To edit a cloned or hypothetical component:

1. Open the Fluid Package view and click the **Components** tab.
2. Select the component you want to edit and open the Component view of the component by doing one of the following:
 - Select the component from the Available Component List/Filter Options list and click the **Edit** button.
 - Select the component from the Selected Components list and click the **View** button.
 - Double-click the component from the Selected Components list.
3. Edit the component using the options available in the Component view. Refer to [Section 9.4 - Component View](#) for more information about the options available in the tabs.

The only instances in which you are allowed to edit in the Component view is when you clone a component or create a hypothetical component.



Close icon

4. When you are done editing the component, click the **Close** icon to close the Component view.

Estimation Methods for Created Components

The program currently supports the same standard estimation methods supported by COMThermo Workbench and HYSIM. It is very important that after you finish creating a new component, you click the **Estimate** button to finish estimating any fundamental pure component physical properties. If you do not do this, missing physical properties can result in incorrect calculations.

The following sequence lists the process used to determine which estimation methods will be used for any unknown Physical Properties:

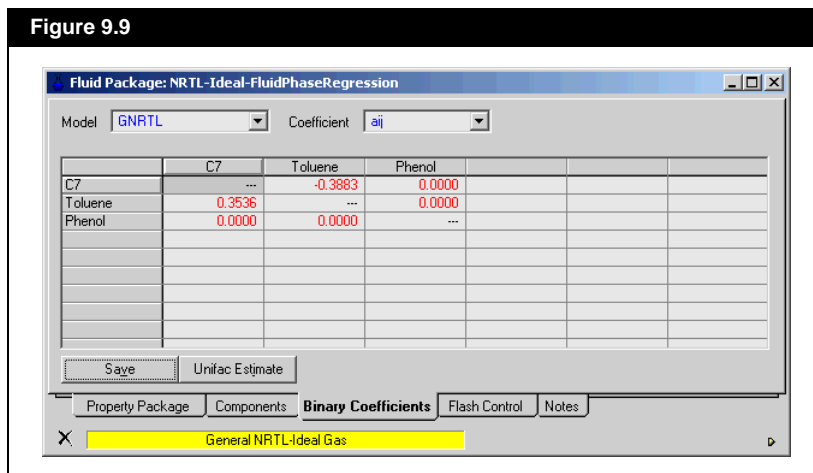
1. If the component is not solid, hydrocarbon, or miscellaneous, a group contribution method will be used for T_c , P_c , V_c , enthalpies of formation, ideal gas, and Gibbs free energy.
2. If only the normal boiling point is known, and the normal boiling point is $< 150^\circ\text{F}$, the Bergman correlation is used for normal liquid density and molecular weight. If the normal boiling point is $> 150^\circ\text{F}$, the Whitson correlation is used for normal liquid density and the Lee-Kesler correlation for molecular weight.
3. If the normal liquid density and molecular weight are known, a proprietary method for normal boiling point will be used.
4. If normal liquid density is $> 1076 \text{ kg/m}^3$, or normal boiling point is $> 800 \text{ K}$, the Lee-Kesler correlation will be used for T_c , P_c and acentric factor.
5. If normal boiling point is $< 548.15 \text{ K}$ and normal liquid density is $< 850 \text{ kg/m}^3$, the Bergman correlation will be used for T_c , P_c and acentric factor.
6. In all other cases, Cavett will be used for T_c and P_c , and Edmister will be used for the acentric factor.
7. Cavett will be used for ideal gas enthalpies.
8. If the component is a Hydrocarbon, the Lee-Kesler correlation will be used for vapour pressures, and Twu for liquid viscosities.
9. In all other cases, Riedel will be used for vapour pressures and Letsou-Stiel for liquid viscosities.
10. W_{srk} will be set equal to the acentric factor.
11. V_{char} will be fitted to match the normal liquid density.

12. A proprietary correlation will be used for radius of gyration.

9.3.3 Binary Coefficients Tab

The Binary Coefficients tab allows you to manipulate the fluid behaviour coefficients between components based on the specified property package.

Figure 9.9



The following table lists and describes the objects in the Binary Coefficients tab:

Object	Description
Model drop-down list	Allows you to select the model used to calculate the fluid behaviour. The models available will depend on the type of property package selected.
Coefficient drop-down list	Allows you to select different coefficient variables of the model to manipulate. The number of coefficient variables varies depending on the model selected.
Binary Interaction Coefficient matrix	Displays the binary interaction values of the selected coefficient variables associated with the selected models.
Save button	Allows you to save the binary coefficients for the selected components and property package for future use.
Unifac Estimate button	Allows you to estimate missing coefficients.

For more information regarding the Binary Interaction Coefficient matrix, refer to the section [Binary Interaction Coefficient Matrix](#).

Binary Interaction Coefficient Matrix

The Binary Interaction Coefficient matrix is the basic tool for determining the fluid behaviour described by a specific property package.

The Binary Interaction Coefficients are determined as follows:

Method of Determination	Description
User Supplied	To directly input any of the binary interaction coefficients into the Binary Interaction Coefficient Matrix, click in a cell and enter a value.
Unifac Estimate	The program will estimate the binary interaction coefficients when you click the Unifac Estimate button.

Estimation Methods

The options available in the Model and Coefficient drop-down lists on the Fluid Package view depend on the property package and components you select.

The program currently uses only the UNIFAC-VLE estimation method.

UNIFAC VLE

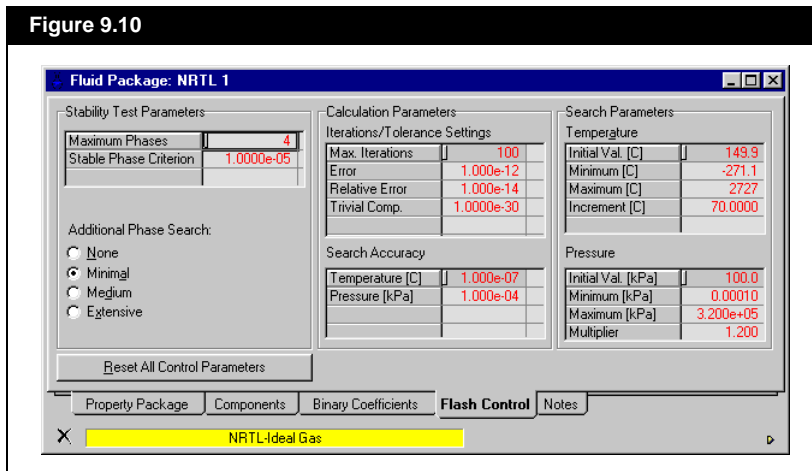
UNIFAC estimations are, by default, performed at 25°C.

The UNIFAC correlation can be used to fill in or replace any of the binary values. When this option is selected, missing parameters are calculated using the UNIFAC FLE estimation method.

9.3.4 Flash Control Tab

The Flash Control tab allows you to manipulate the flash calculation parameters.

Figure 9.10



The Flash Control tab is divided into three groups: Stability Test Parameters, Calculation Parameters, and Search Parameters. Each group and the objects within the groups are described in the following sections.

The Reset All Control Parameters button allows you to reset all the values changed in the Flash Control tab to the program's default settings.

Stability Test Parameters Group

The Stability Test Parameters group allows you to control how phase stability calculations are performed.

Phase Stability Test

For multi-phase fluids, there are multiple false solutions corresponding to the lower number of phases; for example, for a three-phase fluid, there is a three-phase solution, at least three two-phase solutions and multiple single-phase solutions. The major challenge is in converging to the right solution without prior knowledge of the number of equilibrium phases.

If you encounter situations where the flash calculation fails or you are suspicious of the results, you can use the options in the Stability Test Parameters group to approach the solution using a different route. Unless there is strong evidence for three phases, a two-phase flash is first performed. The resulting phases are then tested for their stability.

Maximum Phases Cell

To specify the maximum number of phases allowed, enter a value in the Maximum Phases cell. If it is set to 2, the stability test will quit after a two-phase flash. Occasionally, you may still get three phases, as the algorithm might attempt to start directly with the three-phase flash.

If the true solution has two phases and the maximum phases allowed is set to 2, there is still no guarantee that the correct solution will be reached. For example, for binary mixtures around the azeotropic point, the correct solution might be liquid-liquid equilibrium, but the algorithm might incorrectly converge to vapour-liquid equilibrium.

Stable Phase Criterion Cell

A phase's stability is determined by solving for the distance between a tangent plane and the Gibbs energy surface. If the distance is positive at all points, the phase is stable.

The Stable Phase Criterion default value is 1×10^{-5} . If your situation requires extreme consistency between the saturation calculation and the PT flash calculation, the criterion should be decreased accordingly. In this case, it is advisable to set the Additional Phase Search criterion to Extensive by clicking the appropriate radio button.

An iterative procedure is used in the phase calculations; a phase is generally considered stable if the distance is greater than a small negative number, δ , at all points. This is to avoid incorrectly introducing a second phase into the system.

If the fluid is very close to the phase boundary but inside the two-phase region, however, the 'distance' could be slightly negative for a very small region. If $|\delta|$ is too large, the flash may mistake this fluid to be stable. This can be demonstrated by the following test: First, determine the bubble point temperature, T_b , of a normal fluid at a pressure of 1 atm (using the Stream Manager). Then, perform PT flash calculations at temperatures progressively closer to but higher than T_b . A single phase region will generally be predicted at a temperature slightly higher than the true bubble point temperature.

To correct for this, you can decrease the absolute value of the δ parameter. The lower limit is zero, where there is no provision for the tolerance of the stability equation. Consider the situation where the fluid is just outside the phase boundary. Since the stability equation is not solved to exactly zero, there is the possibility that the calculated distance is a very small negative value. With a zero δ value, the flash will determine that the fluid is unstable. A second phase will then be introduced and redundant calculations will be performed until the introduced phase eventually disappears. Also, there is the possibility that this "false" phase will be re-introduced by the stability test.

Thus, it is necessary to maintain a balance between accuracy and the efficiency of the flash calculation. The use of the default value should generally provide an accurate determination of the bubble point temperature to about 0.001°C.

Additional Phase Search Radio Buttons

The stability scheme used is that proposed by Michelsen (1982)¹⁰⁰. To choose the method for performing the stability test calculations, click the appropriate radio button:

Radio Buttons	Phase
None	No stability test will be performed.
Minimal	The following methods are used: Deleted Phase, Wilson's Equation and Component Initiation (Water). Only the water component (if it is part of the selected fluid package) is introduced.
Medium	In addition to those methods used for the Minimal method, the Average of Existing and Ideal Gas methods are also included. As well, the heaviest and the lightest components in the fluid are introduced using the Component Initiation method.
Extensive	All Phase Initiation methods will be utilized, and all components will be introduced using the Component Initiation method.

Calculation Parameters Group

The Calculation Parameters group allows you to manipulate the iteration and tolerance settings of various calculation parameters. The options available in the Calculation Parameters group are divided into two tables: Iterations/Tolerance Settings and Search Accuracy.

Iterations/Tolerance Settings Table

The following table lists and describes the options available in the Iterations/Tolerance Settings table:

Cell	Description
Max. Iterations	Allows you to enter the maximum number of iterations executed in the flash calculations. When the algorithm reaches the maximum number of iterations, the calculations stop.
Error	Allows you to enter a value for the error tolerance of the governing flash equilibrium equations. If the equilibrium equation error is less than the value in this cell, the flash algorithm is assumed to have converged.
Relative Error	Allows you to enter a value for the relative error of tolerance between iterations. So, in addition to the above condition, if the change in the error between iterations is less than the value in this cell, the flash is assumed to have converged.
Trivial Comp.	Allows you to enter a value for the trivial composition tolerance value. The trivial composition tolerance is used to detect convergence to the trivial solution (where the compositions in the two phases are identical). If the differences in the compositions of the two phases are all less than the value in this cell, the result is assumed to be trivial.

To avoid discarding azeotropic results, the compressibility (Z) factors for the two phases will be computed and compared in the case where the two phases involved are modeled using the same Property Methods (Equation of State Methods).

Search Accuracy Table

The following table lists and describes the options available in the Search Accuracy table:

Cell	Description
Temperature	Allows you to enter a value for the tolerance in temperature during the secant temperature searches. It is used mainly by the backup flashes.
Pressure	Allows you to enter a value for the tolerance in pressure during the secant pressure searches. It is used mainly by the backup flashes.

Search Parameters Group

The default values in the Search Parameters group come from the COMThermo fluid package *.xml files. Refer to the [Locations Page](#) section in [Section 5.4.4 - Files Tab](#) for information on location of the *.xml files.

The Search Parameters group allows you to manipulate the secant temperature and pressure search options. These options are divided into two tables: Temperature and Pressure.

Temperature Table

The following table describes the options available in the Temperature table:.

Cell	Description
Initial Val	Allows you to enter a value for the initial temperature variable used during secant temperature searches. It is used mainly by the backup flashes.
Minimum	Allows you to enter a value for the minimum temperature variable used during secant temperature searches. It is used mainly by the backup flashes.
Maximum	Allows you to enter a value for the maximum temperature variable used during secant temperature searches. It is used mainly by the backup flashes.
Increment	Allows you to enter a value for the increment variable used during secant temperature searches. It is used mainly by the backup flashes.

To change the values, click in the appropriate table cell and enter the required value. From the drop-down list within the cell, select the appropriate temperature designation.

Pressure Table

The logarithm of Pressure is used as the primary variable for the pressure search, thus an initial Pressure Multiplier is required in place of a pressure increment.

The following table describes the options available in the Pressure table:

Cell	Description
Initial Val	Allows you to enter a value for the initial pressure variable used during secant temperature searches. It is used mainly by the backup flashes.
Minimum	Allows you to enter a value for the minimum pressure variable used during secant temperature searches. It is used mainly by the backup flashes.

Cell	Description
Maximum	Allows you to enter a value for the maximum pressure variable used during secant temperature searches. It is used mainly by the backup flashes.
Multiplier	Allows you to enter a value for the multiplier variable used during secant temperature searches. It is used mainly by the backup flashes.

To change the pressure values, click in the appropriate cell and enter the required value.

9.3.5 Notes Tab

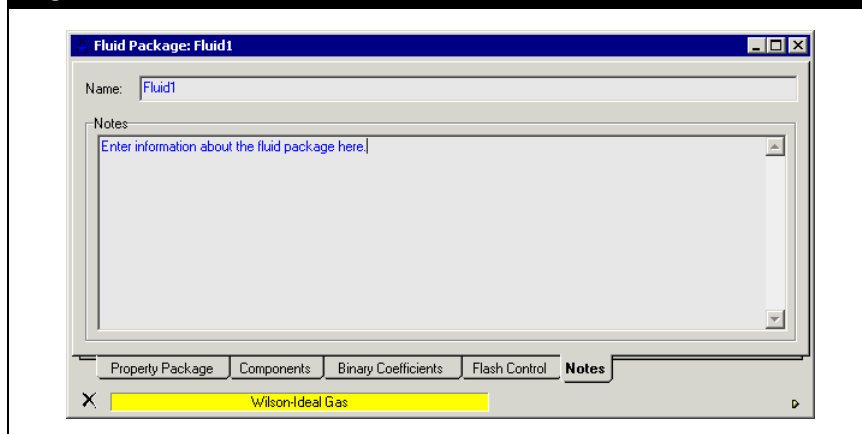
The name in the Name field of the Notes tab will appear in the title bar of the Fluid Package view and the Name field of the Fluid Package Manager view.

The information in the Notes text editor of the Notes tab will appear in the Description text editor of the Fluid Package Manager view.

The Notes tab allows you to do the following:

- Change the name of the active fluid package by entering a new name in the **Name** field.
- Enter information regarding the fluid package by entering the information in the **Notes** text editor.

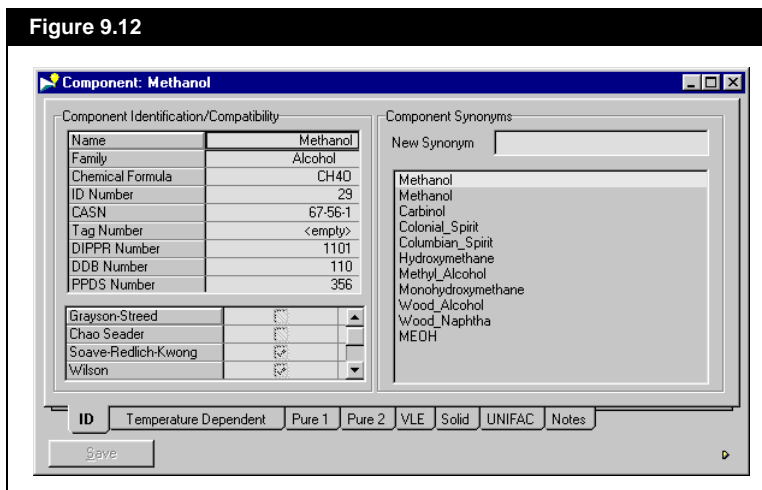
Figure 9.11



9.4 Component View

The Component view displays the physical property data associated with a given component.

Figure 9.12



To access the Component view for any component:

1. Open the Fluid Package view of the fluid package that contains the particular component.
2. Select the **Components** tab.
3. Do one of the following:
 - Select the required component from the Selected Components list and click the **View** button.
 - Select the required component from the Available Component List/Filter Options list and click the **Edit** button.

The following table lists and describes the objects in the Component view:

Object	Description
ID tab	Displays the property packages, various synonyms, and identification numbers associated with the component.
Temperature Dependent tab	Displays the temperature dependent properties in graph or table format.
Pure 1 and Pure 2 tab	Displays the pure component properties in a table.

The Save and Estimate buttons are available only for cloned or hypothetical components.



Open Page Tab as Separate Window icon

Object	Description
VLE tab	Displays the Vapour Liquid Equilibrium pure component parameters in a table.
Solid tab	Displays the pure component solid properties in a table, if the component has solid properties.
UNIFAC tab	Displays the UNIFAC sub-groups associated with the component.
Notes tab	Contains a text editor that allows you to enter information about the component. The component's name appears in the Name field.
Save button	Allows you to save the edited component in the active database.
Estimate button	When clicked, the program estimates the missing property information for the edited component.
Open Page Tab as Separate Window icon	Allows you to open the active tab as a separate view.

The following sections describe each tab in detail.

9.4.1 ID Tab

The ID tab allows you to make a number of changes to a cloned/hypothetical component.

Figure 9.13

Component: C1.1+

Component Identification/Compatibility

Name	C1.1+
Family	Hydrocarbon
Chemical Formula	CH ₄
ID Number	980054620
CASN	74-82-8
Tag Number	1
DIPPR Number	1
DDB Number	1051
PPDS Number	140

UNIQAC ☒
 Amine ☒
 Lee-Kesler-Plöcker ☐
 Extended NRTL ☐

Component Synonyms

New Synonym

C1.1+
 Methane*
 Fire_Damp*
 MethylHydride*
 Marsh_Gas*

ID Temperature Dependent Pure 1 Pure 2 VLE Solid UNIFAC Notes

Save

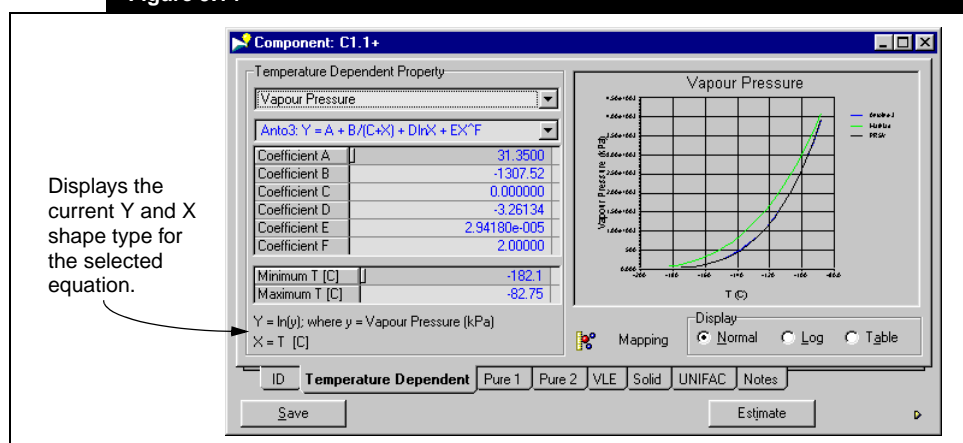
The text in the ID Number field is black, indicating that you cannot change the internal ID Number automatically assigned by the program.

- To edit the component name or formula, click in the **Name** or **Chemical Formula** field and enter the new name or formula.
- To edit the component's association to the component family, click in the **Family** field and select a new family name from the drop-down list.
- To edit the ID numbers associated with the component, enter them in the various number identification fields. Unless you have reliable information, however, editing the ID numbers is not recommended.
- To change the property packages associated with the component, check or uncheck the checkboxes beside the property packages.
- To add another synonym to the component, click in the **New Synonym** field and enter the synonym.

9.4.2 Temperature Dependent Tab

The Temperature Dependent tab allows you to change the type of equations and the coefficient values used to calculate the temperature dependent properties.

Figure 9.14



You can change the coefficient values used to calculate the properties by entering different values in the coefficient cells.

You can change the temperature range for the plot or the table by entering a different temperature value in the Minimum T and Maximum T fields.

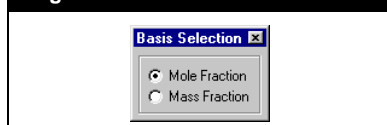


Change Component Basis icon

The following list describes the options available on this tab:

- To select which temperature dependent property you want to manipulate, click the first Temperature Dependent Property drop-down list and select the required property.
- To edit the equation for the selected property, click the second Temperature Dependent Property drop-down list and select the required equation.
- To change the values of the coefficient used in the selected equation, click in the appropriate cell of the Coefficient table and enter new values.
- To change the temperature range for the calculation, click in the Minimum T and Maximum T cells and enter new values.
- To change the component basis displayed in the plot, click the Change Component Basis. The Basis Selection view appears.

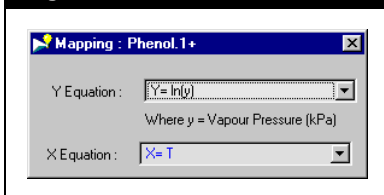
Figure 9.15



On the Basis Selection view, switch between mass and molar fraction by clicking the appropriate radio button.

- To change the shape of the Y and X type in the selected equation, click the **Mapping** button. The Mapping view appears.

Figure 9.16



Use the Y Equation drop-down list to change the shape of the Y variable. Use the X Equation drop-down list to change the shape of the X variable.

- To change the view format for the calculated information, click the **Normal**, **Log** or **Table** radio button in the Display group.

Refer to [Section 7.4 - Plot Area](#) and [Chapter 8 - Plot Properties](#) for information on manipulating plots.

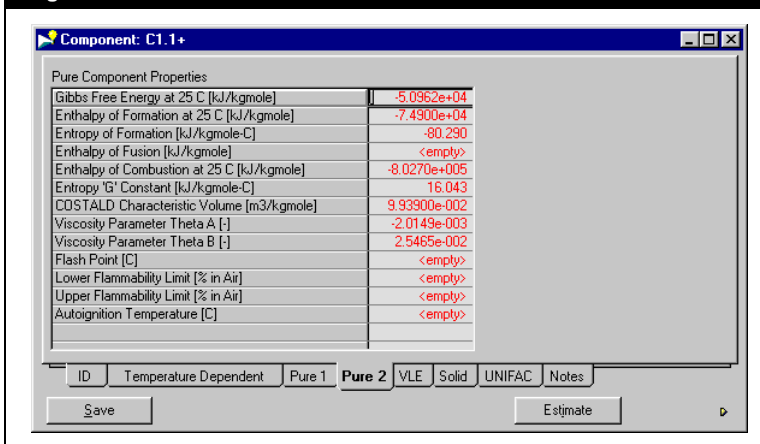
9.4.3 Pure 1 and Pure 2 Tabs

If the UNIFAC sub-group has been created or modified, a pure component property can be modified by:

1. Selecting the cell of a Pure 1 or Pure 2 property, and pressing **DELETE** to delete the default value.
2. Clicking the **Estimate** button to calculate the new value of the property.

The Pure 1 and Pure 2 tabs allow you to modify any of the properties displayed in the tabs.

Figure 9.17



In addition to editing the properties, you can also set the type of component in the Component Type group on the Pure 1 tab to Normal, Non-Condensable, or Non-Volatile.

Figure 9.18

Pure Component Properties	
Molecular Weight [g/gmol]	16.04
Normal Boiling Point [C]	-161.52
Melting Point [C]	<empty>
Standard Liquid Density [kg/m3]	299.4
Critical Temperature [C]	-82.45
Critical Pressure [kPa]	4641
Critical Volume [m3/kgmole]	0.0990
Critical Compressibility [1/kPa]	0.2898
Acentric Factor [-]	1.1498e-002
Dipole Moment [Debye]	0.00000
Radius of Gyration [Angstrom]	1.1180
Peneloux Volume Shift [m3/kgmole]	0.000000
Cavett Parameter [-]	0.2937
Refractive Index at 25 C [-]	<empty>

Component Type

☐ Normal

☒ Non-Condensable

☐ Non-Volatile

ID Temperature Dependent **Pure 1** Pure 2 VLE Solid UNIFAC Notes

Save Estimate

9.4.4 VLE Tab

The VLE tab allows you to manipulate the values of the Vapour Liquid Equilibrium parameters.

Figure 9.19

VLE Pure Component Parameters	
Chao Seader Molar Volume [m3/kgmole]	52.0000
Chao Seader Acentric Factor [-]	0.0000
Chao Seader Solubility Parameter [sqrt(cal.mole/cm3)]	5.6800
Wilson Molar Volume [m3/kgmole]	0.0536
UNIQUAC Volume [R] [-]	1.1239
UNIQUAC Area [Q] [-]	0.99308
Chien Null Volume [-]	7.1867
Chien Null Solubility Parameter [sqrt(cal.mole/cm3)]	6.8519
PRSV Kappa [-]	-1.9270e-002
Mathias Copeman Parameter A [-]	0.00000
Mathias Copeman Parameter B [-]	0.00000
Mathias Copeman Parameter C [-]	0.00000

☒ Henry's Law Standard State

ID Temperature Dependent Pure 1 Pure 2 **VLE** Solid UNIFAC Notes

Save Estimate

9.4.5 Solid Tab

The Solid tab allows you to manipulate the solid properties of the component.

Figure 9.20

The screenshot shows the 'Component: Urea.1+' window with the 'Solid' tab selected. The 'Pure Component Solid Properties' section contains a table with the following data:

Property	Value
Average Diameter [m]	<empty>
Sphericity [-]	<empty>
Surface Area [m ²]	<empty>
% Carbon [-]	<empty>
% Hydrogen [-]	<empty>
% Nitrogen [-]	<empty>
% Oxygen [-]	<empty>
% Sulphur [-]	<empty>
% Chlorine [-]	<empty>
% Other [-]	<empty>

At the bottom, there are tabs for 'ID', 'Temperature Dependent', 'Pure 1', 'Pure 2', 'VLE', 'Solid' (selected), 'UNIFAC', and 'Notes'. There are also 'Save' and 'Estimate' buttons.

9.4.6 UNIFAC Tab

The UNIFAC tab allows you to add and remove sub-groups from the UNIFAC structure.

Figure 9.21

The screenshot shows the 'Component: C1.1+' window with the 'UNIFAC' tab selected. The 'Selected UNIFAC Sub-Groups' section contains a table with the following data:

Sub-Group	Number
<empty>	<empty>

Below this table is a 'Delete Sub-Group' button. The 'Estimated Properties' section contains a table with the following data:

Property	Value
Molecular Weight	<empty>
Temperature [C]	<empty>
Pressure [kPa]	<empty>
Volume [m ³ /kgmole]	<empty>

The 'Available UNIFAC Sub-Groups' section contains a table with the following data:

#	Sub-Group	Bonds	Example Component
1	CH3	1	2,2,4-Trimethylpentane
2	CH2	2	2,2,4-Trimethylpentane
3	CH	3	2,2,4-Trimethylpentane
4	C	4	2,2,4-Trimethylpentane
5	CH2=CH	1	3-Methyl-1-Hexene
6	CH=CH	2	3-Methyl-1-Hexene
7	CH2=C	2	3-Methyl-1-Hexene
8	CH=C	3	3-Methyl-1-Hexene
9	C=C	4	3-Methyl-1-Hexene
10	ACH	3	Benzene
11	AC	4	Benzene

At the bottom of the 'Available UNIFAC Sub-Groups' section is an 'Add Sub-Group(s)' button. The 'Structure' field shows '<<< No Structure Available >>>'. At the bottom, there are tabs for 'ID', 'Temperature Dependent', 'Pure 1', 'Pure 2', 'VLE', 'Solid', 'UNIFAC' (selected), and 'Notes'. There are also 'Save' and 'Estimate' buttons.

When you add or remove sub-groups:

- The UNIFAC-calculated properties (found in the Estimated Properties table) will automatically be updated based on the current structure.
- The base and critical properties will automatically be re-calculated using the current structure as predicted by UNIFAC

Adding Sub-Groups

To add sub-group(s), do one of the following:

To select more than one sub-group, use the **SHIFT** or **CTRL** key. This allows you to add all selected sub-groups to the UNIFAC structure at the same time.

- **Select the Sub-Group.** In the Available UNIFAC Sub-Groups list, use the scroll bars to find the sub-group you want. Select the sub-group name and click the **Add Sub-Group(s)** button. The sub-group appears in the Selected UNIFAC Sub-Groups table.
- **Enter the Sub-Group Number.** Each sub-group has a number associated with it. If you know the number of the sub-group you want to add, click in the **<empty>** cell of the Sub-Group column of the Selected UNIFAC Sub-Groups table and enter the sub-group number. In the Number column, enter the quantity required for the new sub-group.
- **Type in the Structure field.** The Structure field, located near the bottom of the tab, lists all sub-groups already installed. To add a new sub-group, click the cursor after the last sub-group in the field and type the sub-group you want to install. The new sub-group appears in the Selected UNIFAC Sub-Groups table. Example: If you want to add an OH group, type 'OH'.

To avoid deleting existing sub-groups in the Structure field, ensure the existing entries are not selected before entering a new sub-group structure.

Deleting Sub-Groups

To delete sub-group(s), do one of the following:

- Click on the appropriate row of either the **Sub-Group** or **Number** column, and click the **Delete Sub-Group** button. The row/sub-group will be deleted.
- In the **Structure** field, select the sub-group(s) you want to remove, and press **DELETE**.

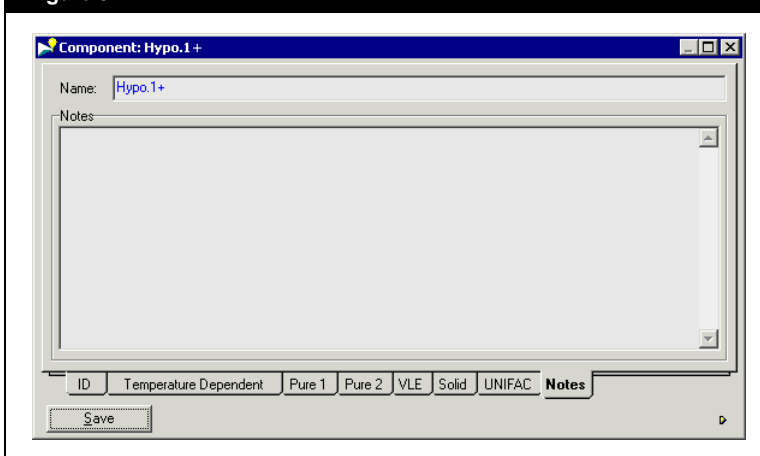
9.4.7 Notes Tab

The name in the Name field of the Notes tab will appear in the title bar of the Component view and the Name field of the ID tab.

The Notes tab allows you to do the following:

- Change the name of the hypothetical/cloned component by entering a new name in the **Name** field.
- Enter information regarding the hypothetical/cloned component by entering the information in the **Notes** text editor.

Figure 9.22



10 Sizing and Costing

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10.1 Capital Cost View

The Capital Cost view is only available in DISTIL.

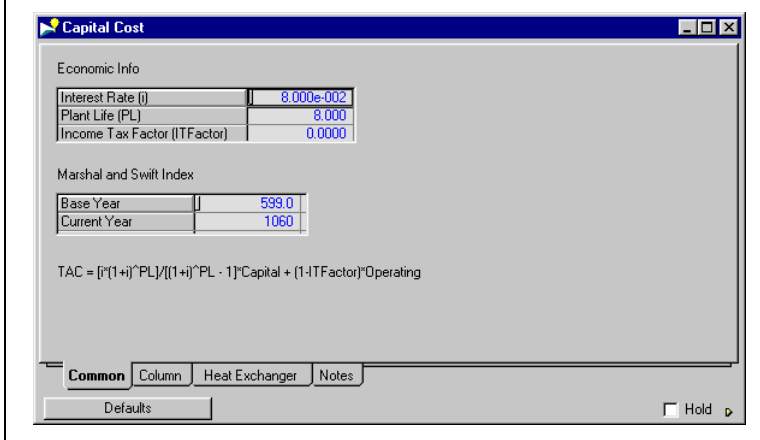
HX-Net has its own Capital Cost calculations located on the **Economics** tab/page.

The Capital Cost view contains all the options required to manipulate the sizing and costing calculations for columns and heat exchangers.

To access the Capital Cost view:

1. Open one of the following operations:
 - Azeotropic Column Sequencing
 - Simple Column
 - Three Product System
 - Complex Column
 - Column Sequencing
2. Go to the **Options** tab/page.
3. Click the **Capital Cost** button. The Capital Cost view appears.

Figure 10.1



The Capital Cost view contains three objects at the bottom of the view that are available for all tabs. The following table lists and describes the three objects:

Object	Description
Defaults button	Allows you to reset all the sizing and costing variables to the program's default values.
Hold checkbox	Allows you to toggle between calculating and not calculating the size and cost for the current operation after changes has been made to the variable values in the Capital Cost view.
Open Page Tab in Separate Window icon	Allows you to open the active tab as a separate view.



Open Page Tab in
Separate Window icon

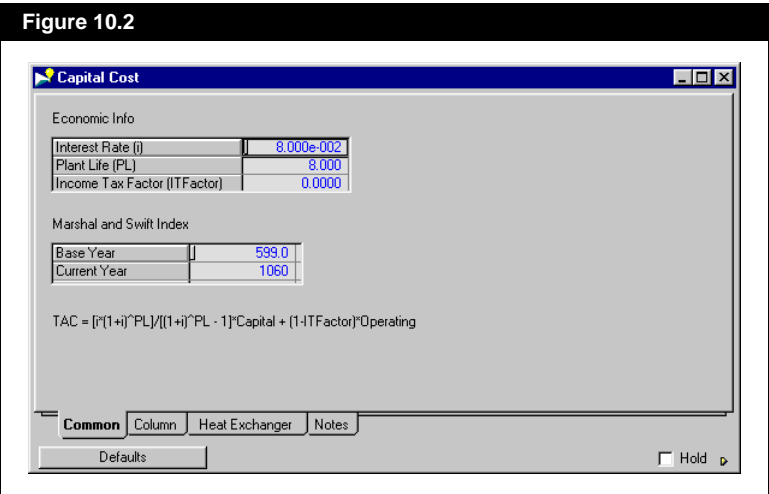
The Capital Cost view is divided into four tabs: Common, Column, Heat Exchanger, and Notes. The following sections describe each of the tabs in more detail.

10.1.1 Common Tab

The TAC value is based on the interest rate, plant life, income tax factor, capital cost, and operating cost.

The Common tab allows you to manipulate the variables used to calculate the total annual cost (TAC).

Figure 10.2



The following table lists and describes the objects available in the Common tab:

Object	Description
Interest Rate field	Allows you to enter the value of the interest rate for the current year. The program's default value is 8%.
Plant Life field	Allows you to enter the number of years the plant will be operational. The program's default value is 8 years.
Income Tax Factor field	Allows you to enter the value of the income tax factor used in economic calculation.
Base Year field	Allows you to enter the Marshall and Swift Index value for the base year. The program's default value is 599.0 from year 1979.
Current Year field	Allows you to enter the Marshall and Swift Index value for the current year. The program's default value is 1060 from year 2001.

10.1.2 Column Tab

The Column tab allows you to manipulate variables used to calculate the size, purchase cost, and installation cost of the column.

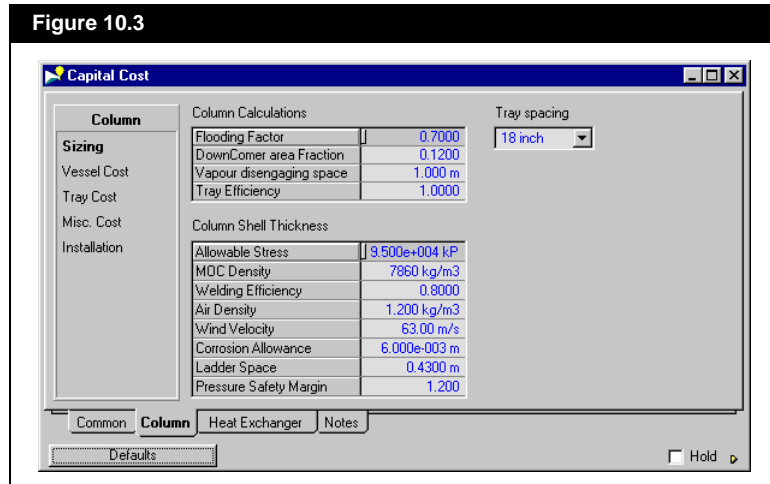
The program's default values are based on a carbon steel construction material for a temperature range of 20°C-80°C.

The variables are grouped into five pages: Sizing, Vessel Cost, Tray Cost, Misc. Cost, and Installation.

Sizing Page

The Sizing page allows you to manipulate variables used to calculate the diameter of the tray, size of the column, and the wall thickness of the column.

Figure 10.3



The following table lists and describes the objects available in the Sizing page:

Object	Description
Flooding Factor cell	Allows you to specify the flooding factor for the trays. The program's default value is 0.70.
DownComer area Fraction cell	Allows you to specify the ratio of downcomer area to the tray area. The program's default value is 0.12.
Vapour disengaging space cell	Allows you to specify the depth of the vapour disengaging space. The program's default value is 1.00 m.
Tray Efficiency cell	Allows you to specify the overall tray efficiency for all the trays in the column. The program's default value is 1.00.
Tray Spacing drop-down list	Allows you to select the tray spacing of the column. The program's default selection is 18 in.
Allowable Stress cell	Allows you to specify the maximum allowable stress of the construction material for the column. The program's default value is 9.5×10^4 kPa.
MOC Density cell	Allows you to specify the construction material density for the column. The program's default value is 7860 kg/m ³ .
Corrosion Allowance cell	Allows you to specify the depth to which the column wall will corrode during the entire service life of the column. The program's default value is 0.006 m.

Flooding factor is the ratio of design vapour velocity to the flooding velocity in the column.

The flooding factor is used to estimate the column diameter.

The program assumes carbon steel as construction material for a temperature range of 20°C to 80°C.

The corrosion is assumed to occur at the inside of the column/vessel wall.

Object	Description
Welding Efficiency cell	Allows you to specify the efficiency of the joints welded together in the column. The program's default value is 0.80.
The following four factors are used to account for the seismic effect of the wind load.	
Air Density cell	Allows you to specify the density of the medium/air surrounding the column. The program's default value is 1.20 kg/m ³ .
Wind Velocity cell	Allows you to specify the maximum wind velocity blowing on to the column. The program's default value is 63 m/s.
Ladder Space cell	Allows you to specify the space between the ladder and the column's outer wall. The program's default value is 0.43 m.
Pressure Safety Margin cell	Allows you to specify the safety margin factor for the pressure in the column. The program's default value is 1.20.

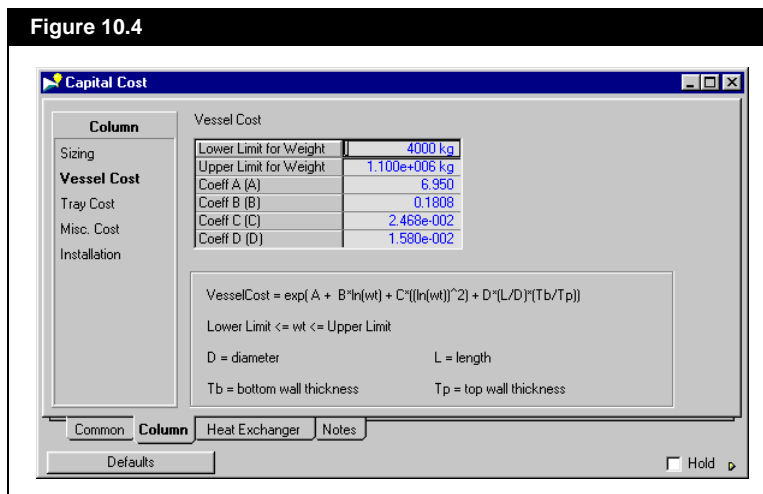
Vessel Cost Page

The vessel cost is a function of the weight, height, and diameter of the column and the coefficient values.

This appears in the equation in the Vessel Cost group.

The Vessel Cost page allows you to manipulate the variables used to calculate the purchase cost of the column vessel.

Figure 10.4



The following table lists and describes the objects available in the Vessel Cost page:

Object	Description
Lower Limit for Weight cell	Allows you to specify the lowest possible weight value for the vessel.
Upper Limit for Weight cell	Allows you to specify the highest possible weight value for the vessel.

The default values in the coefficient cells are for calculations in SI units.

Object	Description
Coeff A cell	Allows you to specify the coefficient value used to calculate the cost of the vessel.
Coeff B cell	Allows you to specify the coefficient value used to calculate the cost of the vessel.
Coeff C cell	Allows you to specify the coefficient value used to calculate the cost of the vessel.
Coeff D cell	Allows you to specify the coefficient value used to calculate the cost of the vessel.

Tray Cost Page

The tray cost is a function of the diameter of the column, the number of trays in the column, and the coefficient values.

This appears in the equation in the Tray/Packing Cost group.

The Tray Cost page allows you to manipulate the variables used to calculate the purchase cost of the column trays.

Figure 10.5

Capital Cost

Tray/Packing Cost

Lower Limit for Diameter	0.6000 m
Upper Limit for Diameter	5.000 m
Coeff A (A)	278.4
Coeff B (B)	0.5705
Coeff C (C)	2.250
Coeff D (D)	1.041

cost per tray = A * exp (B * Dia)

FNT = C/(D * NT)

Total Tray Cost = (cost per tray) * FNT * NT

NT = number of trays

Common **Column** Heat Exchanger Notes

Defaults ☐ Hold

The following table lists and describes the objects available in the Tray Cost page:

Object	Description
Lower Limit for Diameter cell	Allows you to specify the lowest possible diameter value for the tray.
Upper Limit for Diameter cell	Allows you to specify the highest possible diameter value for the tray.
Coeff A cell	Allows you to specify the coefficient value used to calculate the cost of the tray.
Coeff B cell	Allows you to specify the coefficient value used to calculate the cost of the tray.

The default values in the coefficient cells are for calculations in SI units.

Object	Description
Coeff C cell	Allows you to specify the coefficient value used to calculate the cost of the tray.
Coeff D cell	Allows you to specify the coefficient value used to calculate the cost of the tray.

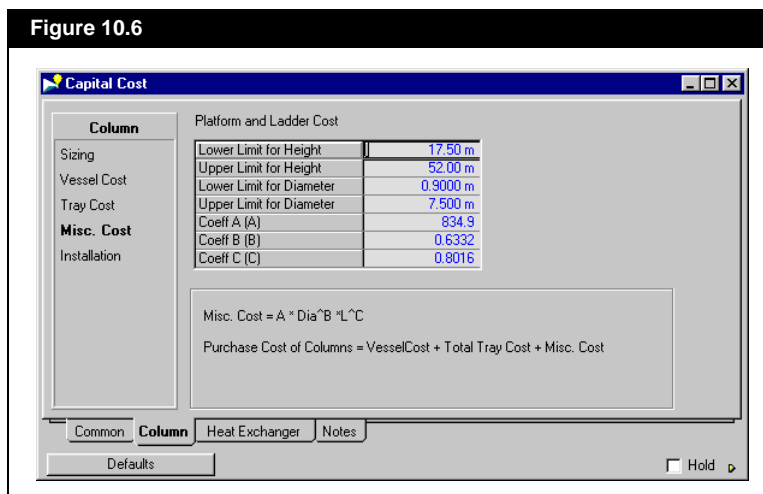
Misc. Cost Page

The miscellaneous cost is a function of the diameter and height of the column, and the coefficient values.

This appears in the equation in the Platform and Ladder Cost group.

The Misc. Cost page allows you to manipulate the variables used to calculate the purchase cost of the ladder and platform for the column.

Figure 10.6



The following table lists and describes the objects available in the Misc. Cost page:

Object	Description
Lower Limit for Height cell	Allows you to specify the lowest possible height value for the tangent-to-tangent length.
Upper Limit for Height cell	Allows you to specify the highest possible height value for the tangent-to-tangent length.
Lower Limit for Diameter cell	Allows you to specify the lowest possible diameter value for the vessel.
Upper Limit for Diameter cell	Allows you to specify the highest possible diameter value for the vessel.
Coeff A cell	Allows you to specify the coefficient value used to calculate the cost of the ladder and platform.

The default values in the coefficient cells are for calculations in SI units.

Object	Description
Coeff B cell	Allows you to specify the coefficient value used to calculate the cost of the ladder and platform.
Coeff C cell	Allows you to specify the coefficient value used to calculate the cost of the ladder and platform.

Installation Page

The installation cost is a function of the column purchase cost and the coefficient values.

This appears in the equation in the Column Installation Cost group.

The Installation page allows you to manipulate the variables used to calculate the installation cost of the column.

Figure 10.7

Capital Cost

Column Installation Cost

Lower Limit for Purchase Cost	5.400e+004
Upper Limit for Purchase Cost	1.810e+006
Coeff A (A)	1.715
Coeff B (B)	0.1513
Coeff C (C)	5.160e-003
Coeff D (D)	1.079
Coeff E (E)	0.2554

Instal.Factor = $A - B \cdot Cf + C \cdot Cf^2 + D / Cf + E / Cf^2$
 where $Cf = (\text{Purchase cost}) / 100000$
 Total Column cost = Instal. Factor * Purchase cost

Common **Column** Heat Exchanger Notes

Defaults

☐ Hold

The following table lists and describes the objects available in the Installation page:

Object	Description
Lower Limit for Purchase Cost cell	Allows you to specify the lowest possible purchase cost of the column.
Upper Limit for Height cell	Allows you to specify the highest possible purchase cost of the column.
Coeff A cell	Allows you to specify the coefficient value used to calculate the installation cost for the column.
Coeff B cell	Allows you to specify the coefficient value used to calculate the installation cost for the column.
Coeff C cell	Allows you to specify the coefficient value used to calculate the installation cost for the column.

The default values in the coefficient cells are for calculations in SI units.

Object	Description
Coeff D cell	Allows you to specify the coefficient value used to calculate the installation cost for the column.
Coeff E cell	Allows you to specify the coefficient value used to calculate the installation cost for the column.

10.1.3 Heat Exchanger Tab

The program's default values are based on a carbon steel construction material and a temperature range of 20°C-80°C.

The Heat Exchanger tab allows you to manipulate the variables used to calculate the design pressure cost factor, design type cost factor, base cost of a heat exchanger, and installation cost of the heat exchanger. The options are grouped into three pages: Sizing, Costing, and Installation.

Sizing Page

The design pressure cost factor is a function of the exchanger area and the coefficient values.

This appears in the equation below the F P Factor tables.

The Sizing page allows you to manipulate three sets of coefficients used for calculating the design pressure cost factor (F_p) for three different pressure ranges.

Figure 10.8

The screenshot shows the 'Capital Cost' software window with the 'Heat Exchangers' tab selected. The 'Sizing' sub-tab is active, displaying three sets of coefficients for different pressure ranges. The equation $F_p = A + B * \log(\text{Area})$ is shown at the bottom.

Pressure Range	Pressure Lower Limit (kPa)	Pressure Upper Limit (kPa)	Coeff A	Coeff B
1	700.0	2100	0.8955	4.981e-002
2	4200	6200	1.427	0.1209
3	2100	4200	1.200	7.140e-002

Equation: $F_p = A + B * \log(\text{Area})$

Buttons: Common, Column, Heat Exchanger, Notes, Defaults, Hold

The following table lists and describes the objects available on the Sizing page:

Object	Description
Pressure Lower Limit cell	Allows you to specify the lowest possible pressure value.
Pressure Upper Limit cell	Allows you to specify the highest possible pressure value.
Coeff A cell	Allows you to specify the coefficient value used to calculate the design pressure factor.
Coeff B cell	Allows you to specify the coefficient value used to calculate the design pressure factor.

The default values in the coefficient cells are for calculations in SI units.

Costing Page

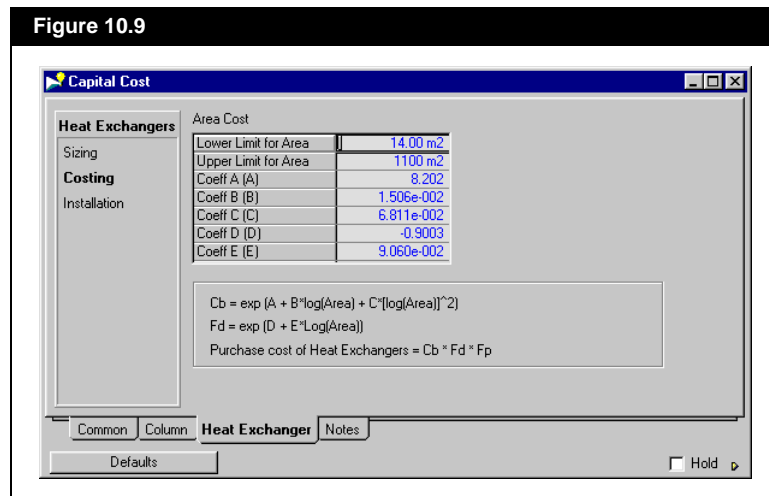
The base cost is a function of the exchanger area and the coefficient values.

The design type cost factor is a function of the exchanger area and the coefficient values.

These appear in the equations in the Area Cost group.

The Costing page allows you to manipulate the variables used to calculate the design type cost factor and base cost of the heat exchanger.

Figure 10.9



The following table lists and describes the objects available on the Costing page:

Object	Description
Lower Limit for Area cell	Allows you to specify the lowest value of the required heat transfer area for the heat exchanger.
Upper Limit for Area cell	Allows you to specify the highest possible value of the heat transfer area for the heat exchanger.

The default values in the coefficient cells are for calculations in SI units.

Object	Description
Coeff A cell	Allows you to specify the coefficient value used to calculate the base cost for the heat exchanger.
Coeff B cell	Allows you to specify the coefficient value used to calculate the base cost for the heat exchanger.
Coeff C cell	Allows you to specify the coefficient value used to calculate the base cost for the heat exchanger.
Coeff D cell	Allows you to specify the coefficient value used to calculate the design type cost factor for the heat exchanger.
Coeff E cell	Allows you to specify the coefficient value used to calculate the design type cost factor for the heat exchanger.

Installation Page

The installation cost is a function of the exchanger purchase cost and the coefficient values.

This appears in the equation in the Heat Exchanger Installation Cost group.

The Installation page allows you to manipulate the variables used to calculate the installation cost of the heat exchanger.

Figure 10.10

Capital Cost

Heat Exchanger Installation Cost

Lower Limit for Purchase Cost	9500
Upper Limit for Purchase Cost	2.400e+005
Coeff A (A)	1.026
Coeff B (B)	8.220e-002
Coeff C (C)	5.400e-003
Coeff D (D)	0.7911
Coeff E (E)	2.500e-002

Instal. Factor = $A - B \cdot Cf + C \cdot Cf^2 + D/Cf + E/Cf^2$
 where $Cf = (\text{Purchase cost})/100000$
 Total Heat Exchanger cost = Instal. Factor * Purchase cost

Common Column **Heat Exchanger** Notes

Defaults ☐ Hold

The following table lists and describes the objects available in the Installation page:

Object	Description
Lower Limit for Purchase Cost cell	Allows you to specify the lowest possible purchase cost of the heat exchanger.
Upper Limit for Height cell	Allows you to specify the highest possible purchase cost of the heat exchanger.
Coeff A cell	Allows you to specify the coefficient value used to calculate the installation cost for the heat exchanger.

The default values in the coefficient cells are for calculations done in SI unit.

Object	Description
Coeff B cell	Allows you to specify the coefficient value used to calculate the installation cost for the heat exchanger.
Coeff C cell	Allows you to specify the coefficient value used to calculate the installation cost for the heat exchanger.
Coeff D cell	Allows you to specify the coefficient value used to calculate the installation cost for the heat exchanger.
Coeff E cell	Allows you to specify the coefficient value used to calculate the installation cost for the heat exchanger.

10.1.4 Notes Tab

The Notes tab allows you to do the following:

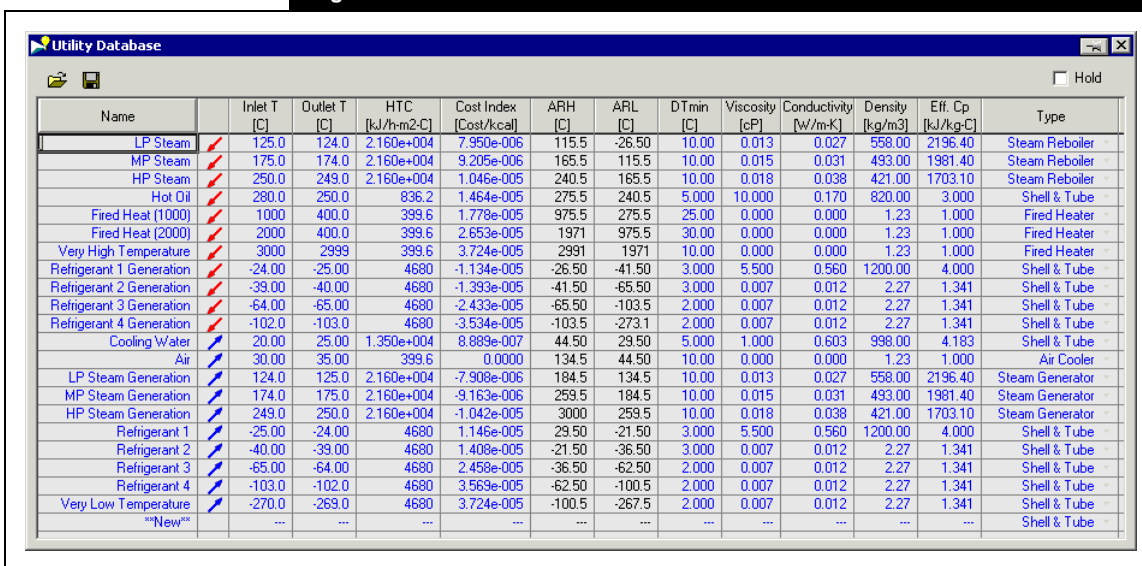
- Change the name of the Capital Cost view by entering a new name in the **Name** field.
- Enter information about the capital cost for the active operation in the **Notes** text editor.

10.2 Utility Database View

The Utility Database view allows you to manipulate existing utilities and/or add a new utility to use for cooling or heating a stream/mixture.

The default location and name for the Utility Database file can be set in the Session Preferences view. Refer to [Section 5.4 - Preferences](#) for more information.

Figure 10.11



Name	Inlet T [C]	Outlet T [C]	HTC [kJ/h-m ² -C]	Cost Index [Cost/kcal]	ARH [C]	ARL [C]	DTmin [C]	Viscosity [cP]	Conductivity [W/m-K]	Density [kg/m ³]	Eff. Cp [kJ/kg-C]	Type
LP Steam	125.0	124.0	2.160e+004	7.950e-006	115.5	-26.50	10.00	0.013	0.027	558.00	2196.40	Steam Reboiler
MP Steam	175.0	174.0	2.160e+004	9.205e-006	165.5	115.5	10.00	0.015	0.031	493.00	1981.40	Steam Reboiler
HP Steam	250.0	249.0	2.160e+004	1.046e-005	240.5	165.5	10.00	0.018	0.038	421.00	1703.10	Steam Reboiler
Hot Oil	280.0	250.0	836.2	1.464e-005	275.5	240.5	5.000	10.000	0.170	820.00	3.000	Shell & Tube
Fired Heat (1000)	1000	400.0	399.6	1.778e-005	975.5	275.5	25.00	0.000	0.000	1.23	1.000	Fired Heater
Fired Heat (2000)	2000	400.0	399.6	2.653e-005	1971	975.5	30.00	0.000	0.000	1.23	1.000	Fired Heater
Very High Temperature	3000	2999	399.6	3.724e-005	2991	1971	10.00	0.000	0.000	1.23	1.000	Fired Heater
Refrigerant 1 Generation	-24.00	-25.00	4680	-1.134e-005	-26.50	-41.50	3.000	5.500	0.560	1200.00	4.000	Shell & Tube
Refrigerant 2 Generation	-39.00	-40.00	4680	-1.393e-005	-41.50	-65.50	3.000	0.007	0.012	2.27	1.341	Shell & Tube
Refrigerant 3 Generation	-64.00	-65.00	4680	-2.433e-005	-65.50	-103.5	2.000	0.007	0.012	2.27	1.341	Shell & Tube
Refrigerant 4 Generation	-102.0	-103.0	4680	-3.534e-005	-103.5	-273.1	2.000	0.007	0.012	2.27	1.341	Shell & Tube
Cooling Water	20.00	25.00	1.350e+004	8.889e-007	44.50	29.50	5.000	1.000	0.603	998.00	4.183	Shell & Tube
Air	30.00	35.00	399.6	0.0000	134.5	44.50	10.00	0.000	0.000	1.23	1.000	Air Cooler
LP Steam Generation	124.0	125.0	2.160e+004	-7.908e-006	184.5	134.5	10.00	0.013	0.027	558.00	2196.40	Steam Generator
MP Steam Generation	174.0	175.0	2.160e+004	-9.163e-006	259.5	184.5	10.00	0.015	0.031	493.00	1981.40	Steam Generator
HP Steam Generation	249.0	250.0	2.160e+004	-1.042e-005	3000	259.5	10.00	0.018	0.038	421.00	1703.10	Steam Generator
Refrigerant 1	-25.00	-24.00	4680	1.146e-005	29.50	-21.50	3.000	5.500	0.560	1200.00	4.000	Shell & Tube
Refrigerant 2	-40.00	-39.00	4680	1.408e-005	-21.50	-36.50	3.000	0.007	0.012	2.27	1.341	Shell & Tube
Refrigerant 3	-65.00	-64.00	4680	2.458e-005	-36.50	-62.50	2.000	0.007	0.012	2.27	1.341	Shell & Tube
Refrigerant 4	-103.0	-102.0	4680	3.569e-005	-62.50	-100.5	2.000	0.007	0.012	2.27	1.341	Shell & Tube
Very Low Temperature	-270.0	-269.0	4680	3.724e-005	-100.5	-267.5	2.000	0.007	0.012	2.27	1.341	Shell & Tube
New	---	---	---	---	---	---	---	---	---	---	---	Shell & Tube





To access the Utility Database view:

- Open an operation view from the following list of operations:
 - HI Case
 - HI Project
 - Complex Column
 - Simple Column
 - Three Product System
 - Column Sequencing
 - Azeotropic Column Sequencing
- Click the **Options** tab or page.

When accessing the Utility Database view from the HI Case or HI Project operation, you will see an extra button called Select Utility beside the Save Default Utilities to File icon

3. Click the **Utility Database** button.
The Utility Database view will appear.

The following table lists and describes the objects available on the Utility Database view:

Object	Icon	Description
Open Saved Default Utilities File icon		Allows you to open a utility database file. The file can be the program's default database file or a user defined utility database file.
Save Default Utilities to File icon		Allows you to save the current settings in the Utility Database view as a file.
Select Utility button		Allows you to add the selected utility to the heat exchanger network.
Name column		Allows you to specify or edit the name of the utility.
Heating or Cooling icon	 	Displays an icon to indicate whether the utility is used for heating or cooling. <ul style="list-style-type: none"> HOT. A hot utility stream is cooled down in the heat exchange network. The inlet temperature of a hot process stream is higher than the outlet temperature. COLD. A cold utility stream is heated up in the heat exchange network. The inlet temperature of a cold process stream is lower than the outlet temperature.
Inlet T column		Allows you to manipulate the temperature of the utility entering the heat exchanger.
Outlet T column		Allows you to manipulate the temperature of the utility exiting the heat exchanger.
HTC column		Allows you to manipulate the heat transfer coefficient of the utility.
Cost Index column		Allows you to manipulate the cost per energy/duty of the utility.
ARH column		Displays the calculated Application Range High temperature value.
ARL column		Displays the calculated Application Range Low temperature value.
DTmin column		Allows you to specify or manipulate the minimum temperature difference of the utility.
Hold checkbox		Allows you to toggle between calculating or not calculating the operating cost.

The Select Utility button is only available when accessing the Utility Database view from the HI Case or HI Project operation.

When the Hold checkbox is checked, the program will hold on to/hide the information in the Utility Database view during calculation. When the checkbox is unchecked, the program will calculate the operating cost using the current information in the Utility Database view.

10.2.1 Adding a New Utility

To add a new utility type to the database:

1. Open the Utility Database view by clicking the **Utility Database** button.
2. Click on the cell containing ****New**** in the Name column.
3. Enter the name of the new utility.
4. Click in the **Inlet T** cell and enter the temperature of the utility going into the heat exchanger.
5. Click in the **Outlet T** cell and enter the temperature of the utility exiting the heat exchanger.
An icon to indicating whether the utility is used for heating or cooling will appear in the icon cell automatically.
6. Click in the **HTC cell** and enter the value for the heat transfer coefficient of the utility.
7. Click in the **Cost Index** cell and enter the value for the cost/duty of the utility.
8. Click in the **DTmin** cell and enter the value for the minimum temperature difference of the utility.

10.2.2 Deleting a Utility

The program will not prompt you to confirm deletion of a utility, so be very careful when deleting a utility.

To delete a utility:

1. Ensure the current operation is not using the utility you want to delete.
2. Open the Utility Database view by clicking the **Utility Database** button.
3. in the **Name** column, click on the name of the utility you want to delete.
4. Press **DELETE**.

10.2.3 Saving the Utility Database

The program allows you to save a utility database as a (*.hud) file.

To save the current utility database:

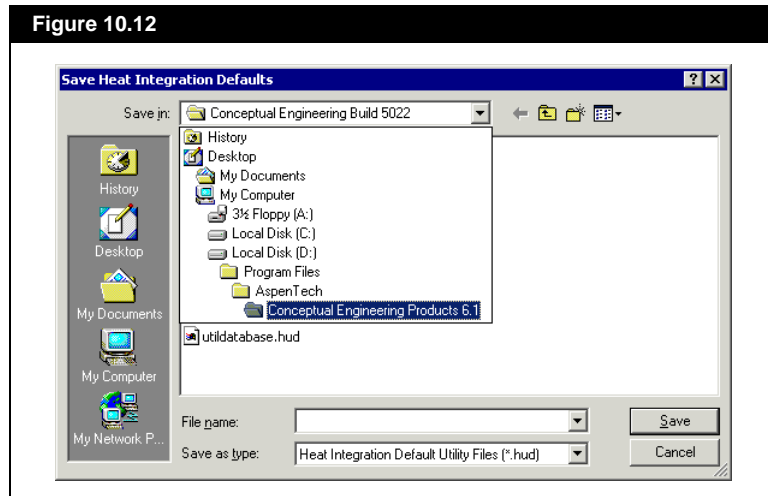
1. Open the Utility Database view by clicking the **Utility Database** button.
2. Modify the utility information to suit your simulation case.
3. Click the **Save Default Utilities to File** icon.



Save Default Utilities to File icon

The Save Heat Integration Defaults view appears.

Figure 10.12



4. Use the **Save in** drop-down list to select a location for the new utility file.
5. In the **File name** field, enter the name of the file.
6. Select the location for the file using the **Save in** drop-down list.
7. Click the **Save** button to save the utility database file.

10.2.4 Recalling a Utility Database

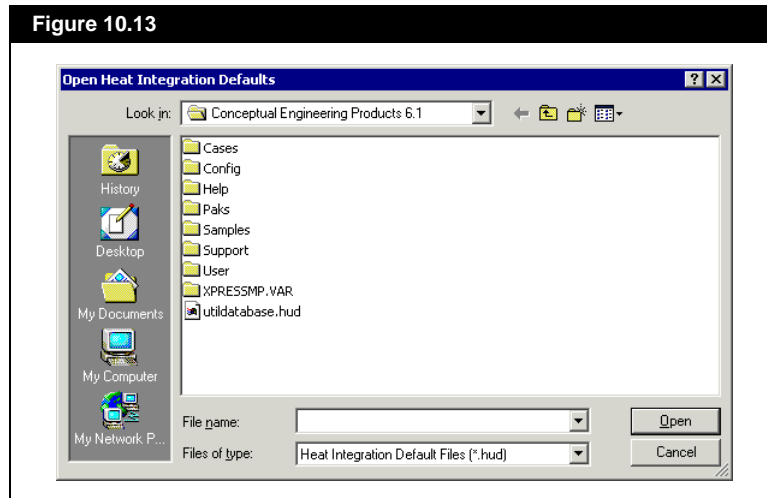
To recall a saved utility database:

1. Open the Utility Database view by clicking the **Utility Database** button.
2. Click the **Open Saved Default Utilities File** icon.
The Open Heat Integration Defaults view appears.



Open Saved Default Utilities
File icon

Figure 10.13



3. Find and select the *.hud file you want using the **Look in** drop-down list.
4. Click the **Open** button.
The Utility Database view reappears displaying the selected utility database information.

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