



CEP 6.2

Installation Guide

Who Should Read this Guide

This guide is for people who will install and configure CEP.

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Installing CEP

Basic Requirements

System Component	Requirements
Operating System	Microsoft Windows 2000/XP
Processor Speed	Pentium II 500 MHz, recommended PIII 700 MHz or better.
RAM requirements	Minimum 128 MB RAM, recommended 256 MB.
Disk Space	Minimum of 300 MB of physical and virtual disk space is required. Recommend 600 MB.
Serial Port	The Hyprotech green security dongle is used with the standalone version of the Conceptual Engineering Product and can only be attached to a serial communications port of the computer running the application (do not plug in a serial mouse behind the security dongle).
Parallel / USB Port	SLM dongles are Sentinel Computer ID dongles, manufactured by Rainbow Technologies. The SLM dongle is installed on the parallel (printer) or USB port of your computer. An arrow indicates which end should be plugged in to the computer. This is the new dongle that is used for both Standalone and Network versions of the Conceptual Engineering Product.
Monitor/Video	Minimum usable: SVGA (800 x 600). Recommended: SVGA (1024 x 768).
Mouse	Required. Note that a mouse cannot be plugged in to the back of the Hyprotech green serial port dongle used with the "standalone" version of the Conceptual Engineering Product.

Licensing Information

You need a license file and hardware security dongle to run the Conceptual Engineering Product. Refer to the **SLM Installation and Reference Guide** for information about licenses.

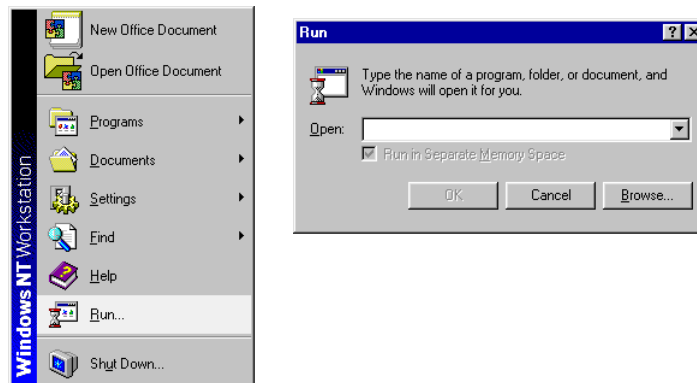
Installing Conceptual Engineering Products

The following instructions are written assuming installation on Windows 2000.

- 1 Shut down all other programs on the computer before starting the installation process.
- 2 Insert the Conceptual Engineering Product software CD into the CD drive of your computer.

Note: For computers which have the CD-ROM Autorun feature enabled, steps 3 and 4 are performed automatically.

- 3 If the **Setup** program does not start automatically, on the **Start** menu, click **Run**.

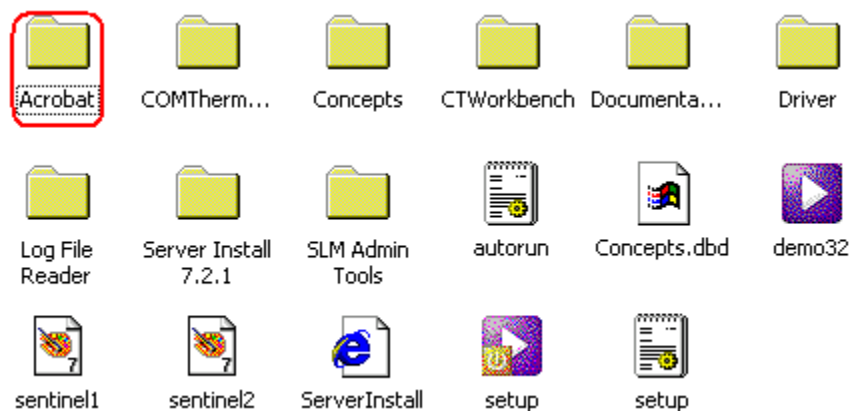


- 4 In the **Open** field of the **Run** view, type: **d:\setup.exe** (where **d:** is your CD drive); then click **OK**.

- 5 If you want to look at the documentation, on the **setup** screen, click **Browse CD Contents**; then open the **Documentation** folder.









Note: To read the documentation, you must install Adobe Acrobat reader. A copy of Adobe Acrobat reader is provided on the CD in the **Acrobat** folder.



6 To start the setup process, on the **setup** screen, click **Install Products**.



-  INSTALL PRODUCTS
-  BROWSE CD CONTENTS
-  VIEW OUR WEBSITE
-  CONTACT ASPENTECH
-  VIEW DOCUMENTATION
-  EXIT

The second **setup** screen appears.



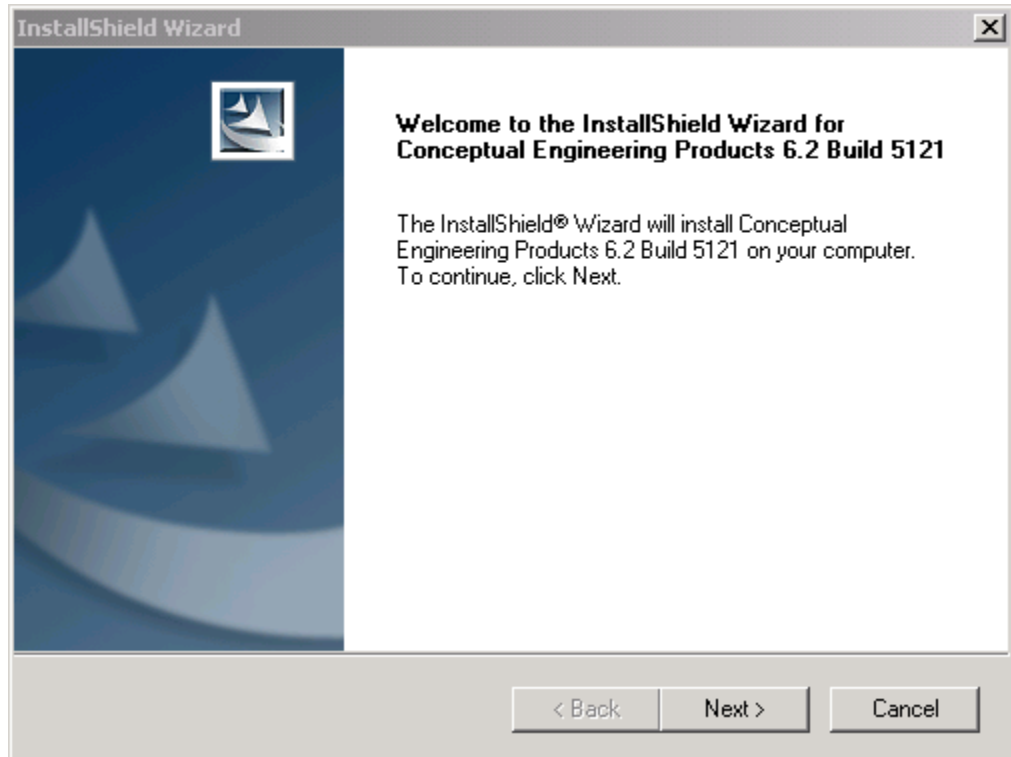
-  Conceptual Engineering
-  COMThermo DK
-  Sentinel Security Tools
-  MAIN MENU

Conceptual analysis methods comprise a set of technologies that can provide engineering "intelligence" to process simulation tools. The Conceptual Engineering Suite is a set of software tools that enable the Process Engineer to access conceptual analysis methods and greatly enhance the value of modeling and simulation efforts via tight integration with HYSYS. The Conceptual Engineering Suite includes functionality that focuses on the analysis and design of distillation columns and column sequences for general multi-component systems, and heat integration projects to improve energy efficiency and reduce total plant cost.

7 On the second **setup** screen, click **Conceptual Engineering**.

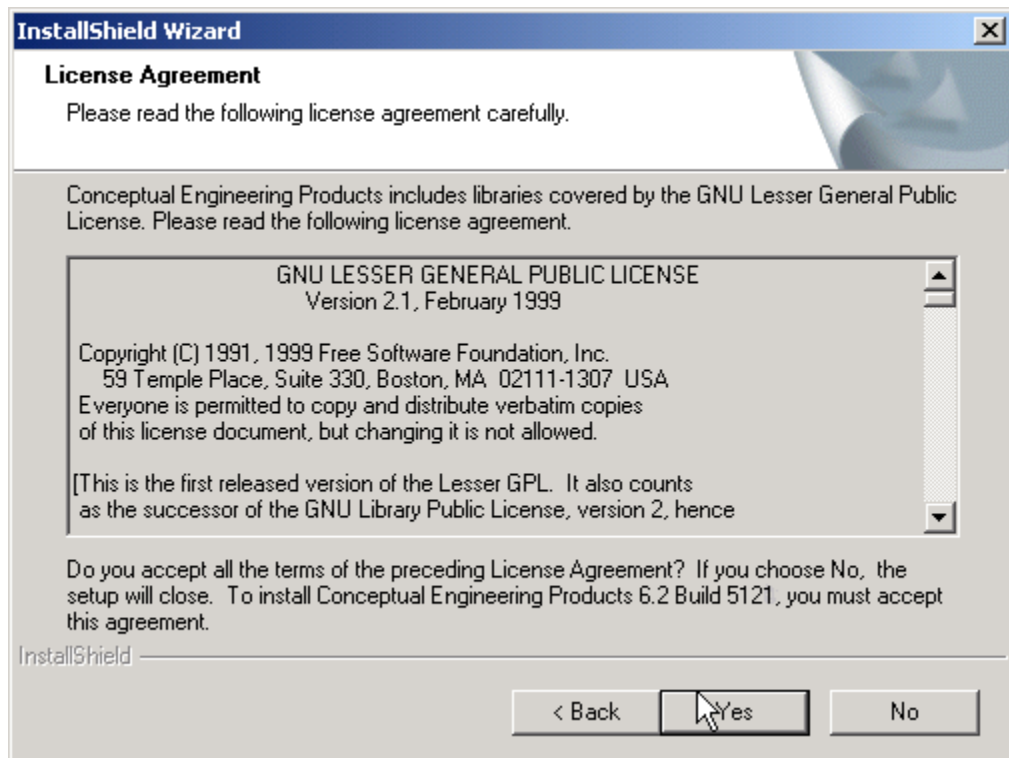
The installation process uses the Windows Installer system. The InstallShield Wizard may take a few moments to load.

The **Welcome** view appears.



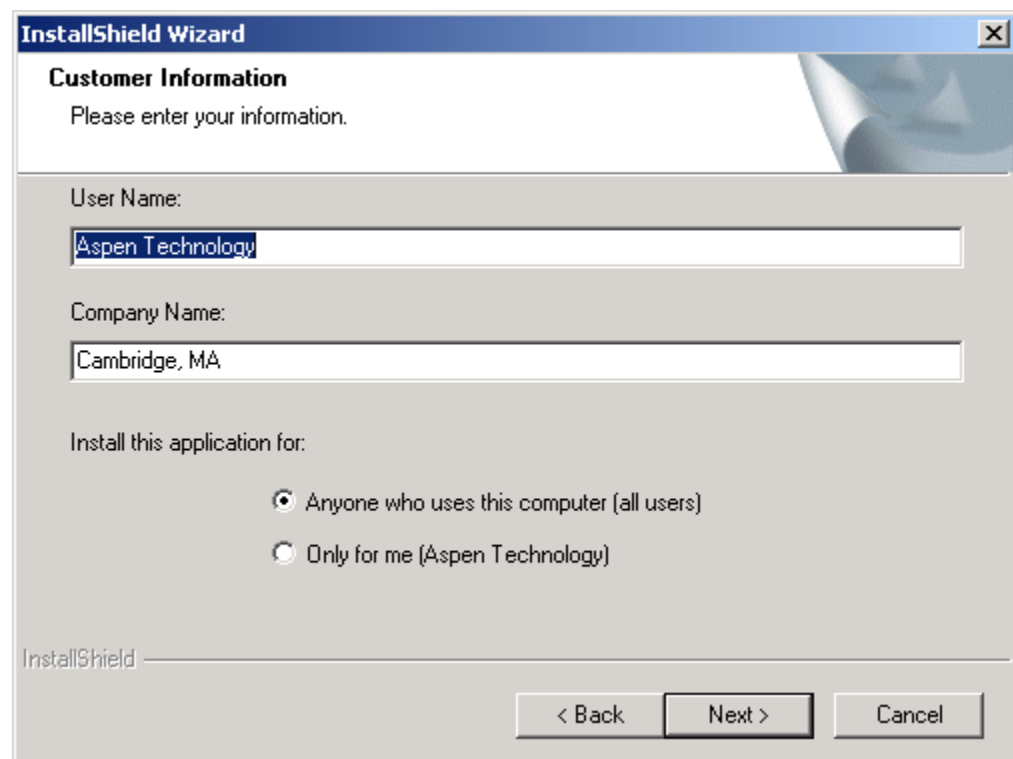
8 Read the information on this view; then click **Next**.

The **License Agreement** view appears.



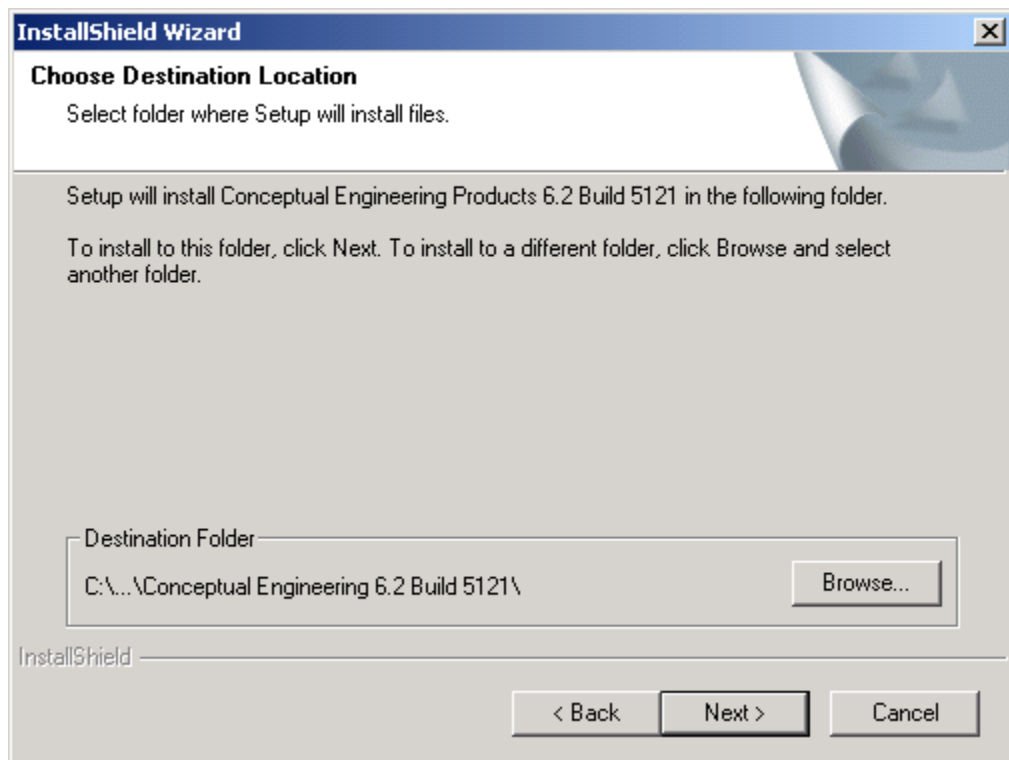
- 9 Read the license agreement carefully. If you accept the terms, click **Yes**. (If you click **No**, the InstallShield Wizard closes.)

The **Customer Information** view appears.



- 10** On the **Customer Information** view, type your name and company information in the appropriate fields.
- 11** Select one of the two options to specify whether the application
- should be available to anyone else who logs onto your machine.
 - should be available only to you when you log onto your machine.
- 12** Click **Next** to move to the next step.

The **Choose Destination Location** view appears.



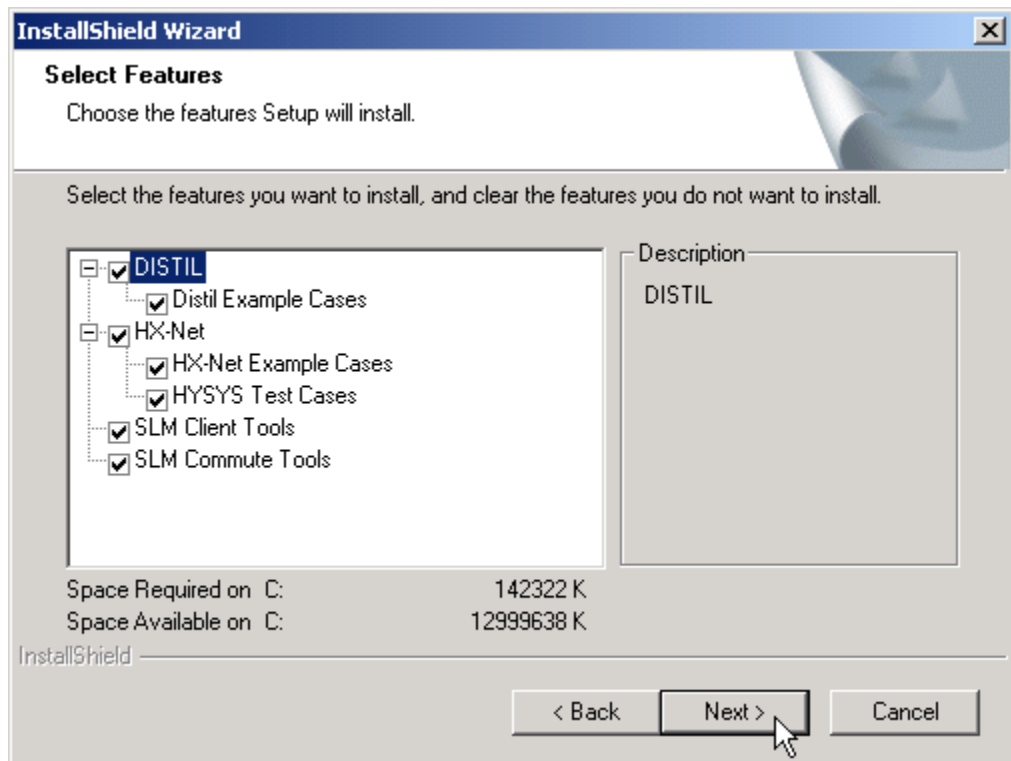
- 13** Use the **Choose Destination Location** view to specify where to install the program files.

By default, the application is stored under the **Program Files\AspenTech\Conceptual Engineering 6.2** directory, but you can change this to a different location by clicking the **Browse** button.

Whatever you select here, a small number of files will be stored to **Program Files\Common Files\Hyprotech**; these are components shared by all Hyprotech tools.

- 14** When you have specified the location, click **Next**.

The **Select Features** view appears.



Use the **Select Features** view to select the features you want to install with the program.

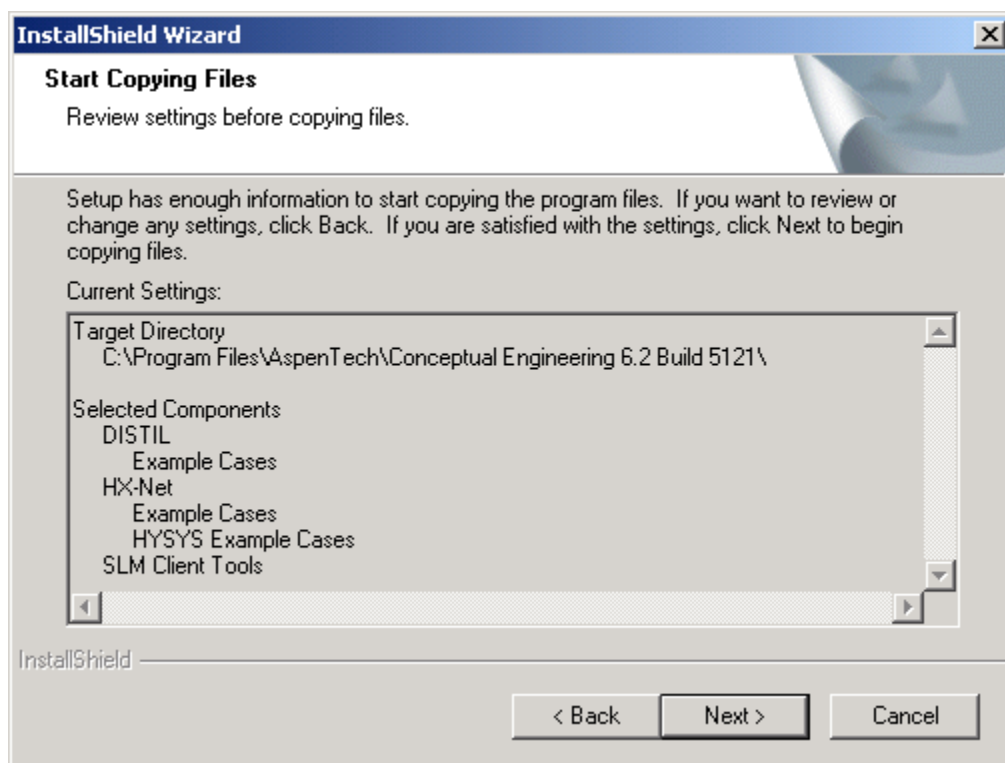
15 Select or clear the appropriate check box beside each feature.

You have now provided the required installation information.

16 To proceed with the installation, click **Next**.

Note: If you want to change any configuration displayed in the Current Settings group, click **Back**.

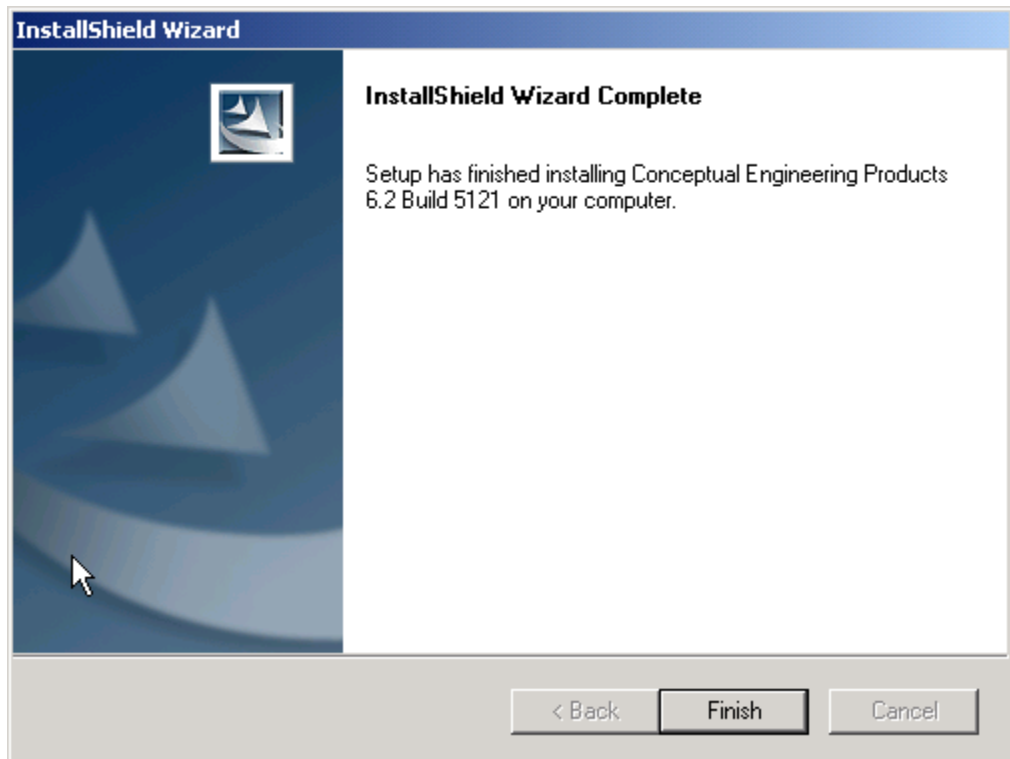
The **Start Copying Files** view appears.



17 On the **Start Copying Files** view, click **Next**.

The installation now begins. The installation may take several minutes.

When the installation has completed, the **InstallShield Wizard Complete** view appears, showing that the installation completed successfully.



18 On the **InstallShield Wizard Complete** view, click **Finish** to complete the installation.

Setting File Location Preferences

To set your file location preferences:

1 Start DISTIL or HX-Net.

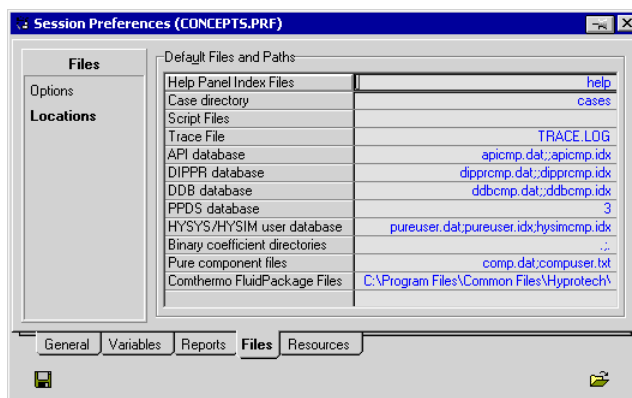
Note: If you do not have a license for any of the Conceptual Engineering Products, an error message will be displayed indicating that the program failed to get the application license.

2 On the **Tools** menu, click **Preferences**.

The **Session Preferences** view appears.

3 On the **Files** tab, select the **Locations** page.

4 Configure the **Default Files and Paths** as shown below. These are suggestions only and some modification may be required.



- 5 Click the **Save preference file** icon ; then save your session preferences to the DISTIL or HX- Net working directory on the local disk.

General Information

This section provides Copyright details and lists any other documentation related to this release.

Copyright

Version Number: 6.2
May 2004

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CEP™, COMThermo®, COMThermo TRC Database™, DISTIL™, DISTIL Complex Columns Module™, FIHR™, FLARENET™, FRAN™, HX-Net®, HX-Net Assisted Design Module™, Hyprotech Server™, HYSYS®, HYSYS Optimizer™, ACM Model Export™, HYSYS Amines™, HYSYS Crude Module™, HYSYS Data Rec™, HYSYS DMC+ Link™, HYSYS Dynamics™, HYSYS Electrolytes™, HYSYS Lumper™, HYSYS Neural Net™, HYSYS Olga Transient™, HYSYS OLGAS 3-Phase™, HYSYS OLGAS™, HYSYS PIPESIM Link™, HYSYS Pipesim Net™, HYSYS PIPESYS™, HYSYS RTO™, HYSYS Sizing™, HYSYS Syntex Reactor Models™, HYSYS Tacite™, HYSYS Upstream™, HYSYS for Ammonia Plants™, MUSE™, PIPE™, Polymers Plus®, Process Manuals™, Process Tools™, ProFES 2P Tran™, ProFES 2P Wax™, ProFES 3P Tran™, ProFES Tranflo™, STX™, TASC-Thermal™, TASC-Mechanical™, Aspen Plus®, ACOL™, ACX™, APLE™, Aspen Adsim™, Aspen Aerotran™, Aspen CatRef®, Aspen Chromatography®, Aspen Custom Modeler®, Aspen Decision Analyzer™, Aspen Dynamics®, Aspen Enterprise Engineering™, Aspen FCC®, Aspen Hetran™, Aspen Hydrocracker®, Aspen Hydrotreater™, Aspen Icarus Process Evaluator™, Aspen Icarus Project Manager™, Aspen Kbase™, Aspen Plus® HTRI®, Aspen OLI™, Aspen OnLine®, Aspen PEP Process Library™, Aspen Plus BatchFrac™, Aspen Plus Optimizer™, Aspen Plus RateFrac™, Aspen Plus SPYRO®, Aspen Plus TSWEET®, Aspen Split™, Aspen WebModels™, Aspen Pinch®, Aspen Properties™, Aspen SEM™, Aspen Teams™, Aspen Utilities™, Aspen Water™, Aspen Zyqad™, the aspen leaf logo and Enterprise Optimization are trademarks or registered trademarks of Aspen Technology, Inc., Cambridge, MA.

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Related Documentation

In addition to this document, a number of other documents are provided to help you learn and use CEP 6.2.

Title	Content
SLM Installation and Reference Guide	Information on license installation and configuration
Azeotropic Separation Guide	Information on working with Azeotropes
Heat Integration Guide	Information on working with Heat Exchanger Networks
Reference Guide	Reference material for HX-Net and Distill
Separation Guide	Information on using the Separation Manager view
Thermodynamic Workbench Guide	Information on using the Thermodynamic Workbench view
Tutorials	Step-by-step tutorials on how to use HX-Net and Distill
User Guide	General information on how to use HX-Net and Distill

Technical Support

Online Technical Support Center

AspenTech customers with a valid license and software maintenance agreement can register to access the Online Technical Support Center at:

<http://support.aspentech.com>

You use the Online Technical Support Center to:

- Access current product documentation.
- Search for technical tips, solutions, and frequently asked questions (FAQs).
- Search for and download application examples.
- Search for and download service packs and product updates.
- Submit and track technical issues.
- Search for and review known limitations.
- Send suggestions.

Registered users can also subscribe to our Technical Support e-Bulletins. These e-Bulletins proactively alert you to important technical support information such as:

- Technical advisories.
- Product updates.
- Service Pack announcements.
- Product release announcements.

Phone and E-mail

Customer support is also available by phone, fax, and e-mail for customers who have a current support contract for their product(s). Toll-free charges are listed where available; otherwise local and international rates apply.

For the most up-to-date phone listings, please see the Online Technical Support Center at:

<http://support.aspentech.com>

Support Centers	Operating Hours
North America	8:00 – 20:00 Eastern time
South America	9:00 – 17:00 Local time
Europe	8:30 – 18:00 Central European time
Asia and Pacific Region	9:00 – 17:30 Local time

Getting Started

This chapter gives a quick introduction of the Conceptual Engineering Product. It illustrates how to:

- recall a saved case.
- manipulate a Residue Curve Map (RCM) operation.
- manipulate data within a Heat Integration Project.

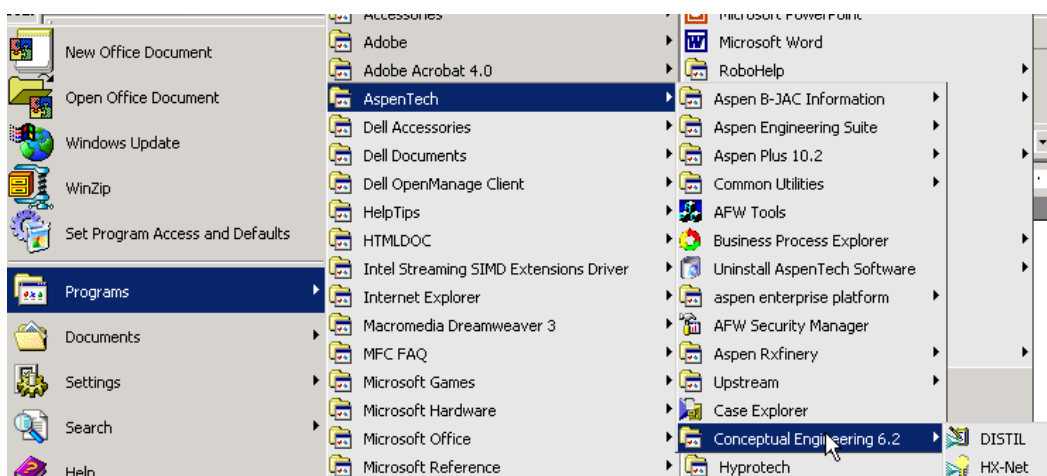
Starting Conceptual Engineering Products

Note: If you do not have a license for any of the Conceptual Engineering Products, an error message will be displayed indicating that the program failed to get the application license.

The Conceptual Engineering Products consists of two programs:

- DISTIL
- HX-Net

After you have successfully installed the Conceptual Engineering Product, an individual start menu option is created for each program, as shown here.



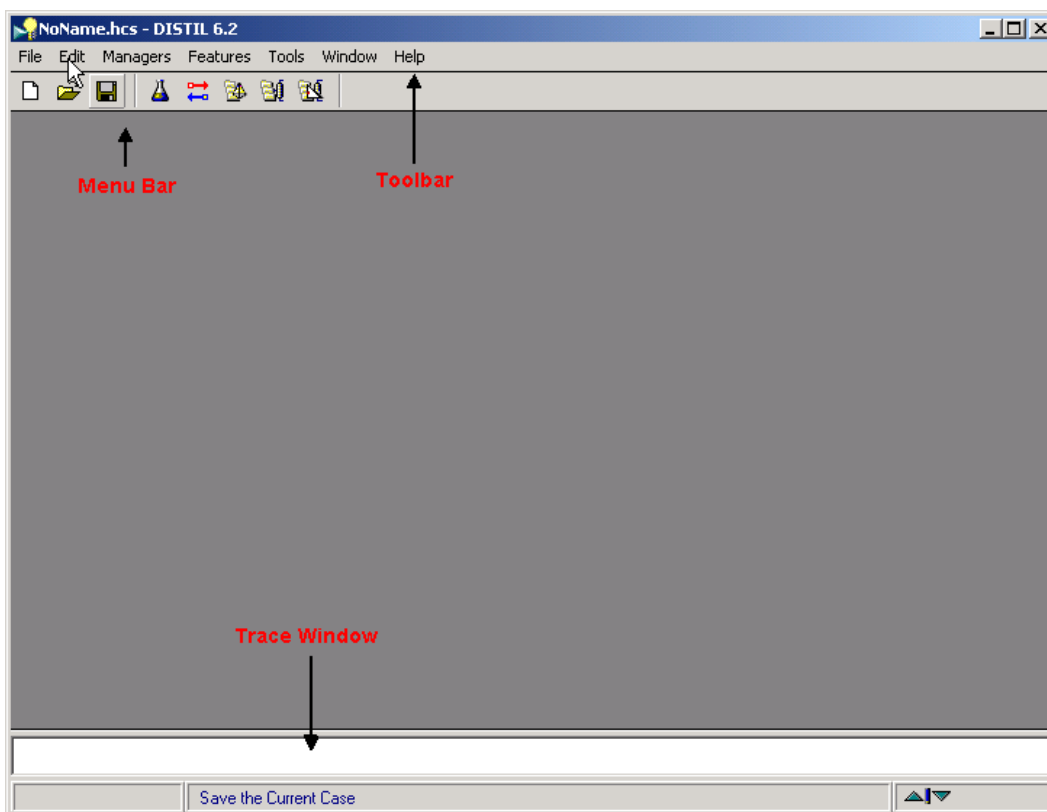
To start a program in the Conceptual Engineering Product

- 1 In the Windows desktop, click **Start | Programs**.
- 2 On the **Programs** menu, click **AspenTech | Conceptual Engineering 6.2**.
- 3 Click the program you have a license for (**DISTIL** or **HX-Net**).

The program begins to load.

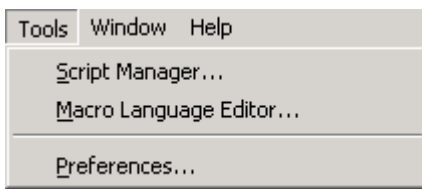
Now you are ready to begin working with the program.

The first thing you will see is the Desktop of the program you want to use. The figure here displays the Desktop view for DISTIL.



Setting Unit Preferences

Before opening the pre-built Getting Started case, you should choose the unit set used for displaying information. You can check your current unit set by accessing the **Session Preferences** view.

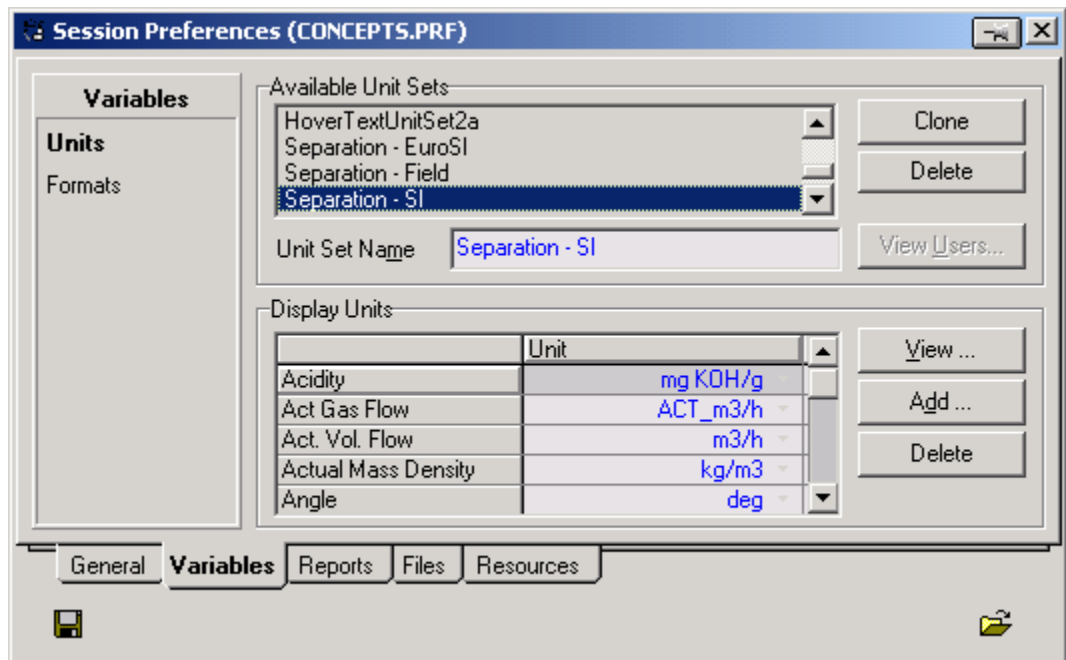


- 1 On the **Tools** menu, click **Preferences**.

The **Session Preferences** view appears.

2 On the **Session Preferences** view, click the **Variables** tab.

The **Variables** tab appears, displaying the default **Units** page.



The current unit set is shown highlighted in the **Available Unit Sets** list. The Conceptual Engineering Product default unit set is **SI**.

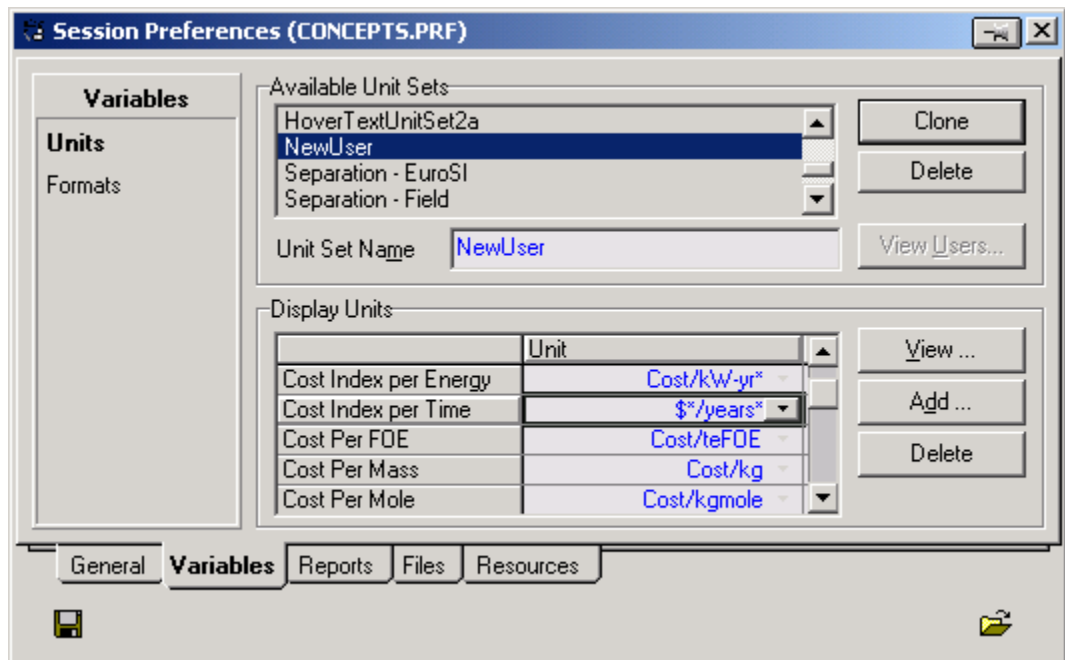
3 Create a new Unit Set by clicking **Clone**.


The Conceptual Engineering Product automatically names the new unit set as **NewUser**.

4 In the **Display Units** group, scroll to the **Cost Index per Time** cell.

5 Click the **Cost Index per Time** cell; then press the **SPACE BAR**.

6 Select **Cost/year** as the unit for **NewUser**.




7 Click the **Close** icon  to close the **Session Preferences** view.

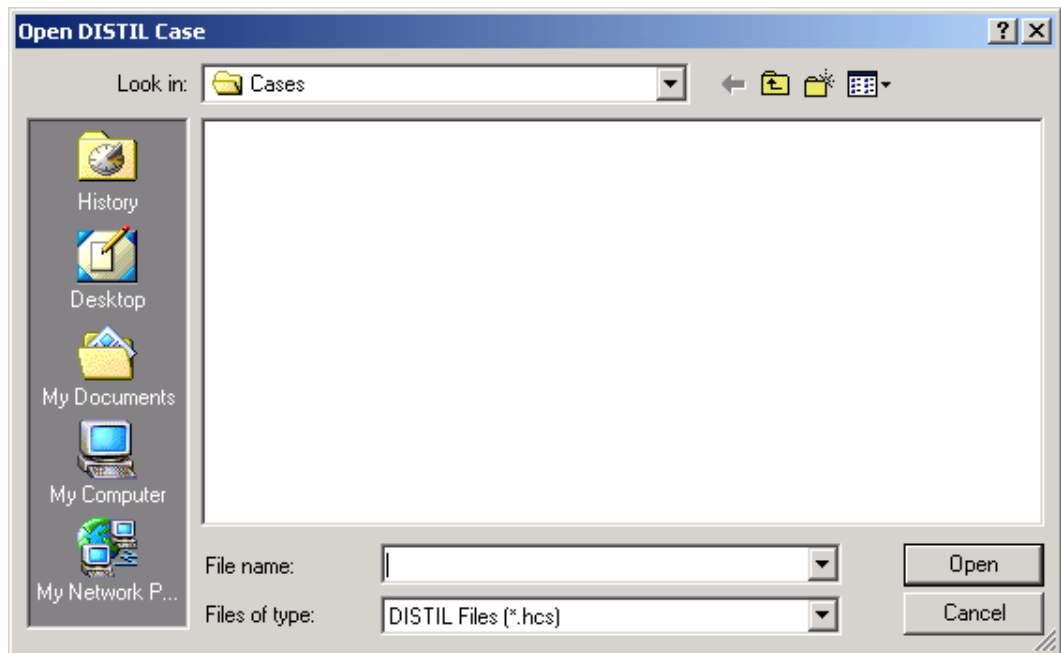
Recalling a Saved Case

Included with your Conceptual Engineering Product package are several pre-built synthesis cases. These cases are located in the **Samples** subdirectory of the program root directory for the Conceptual Engineering Product.

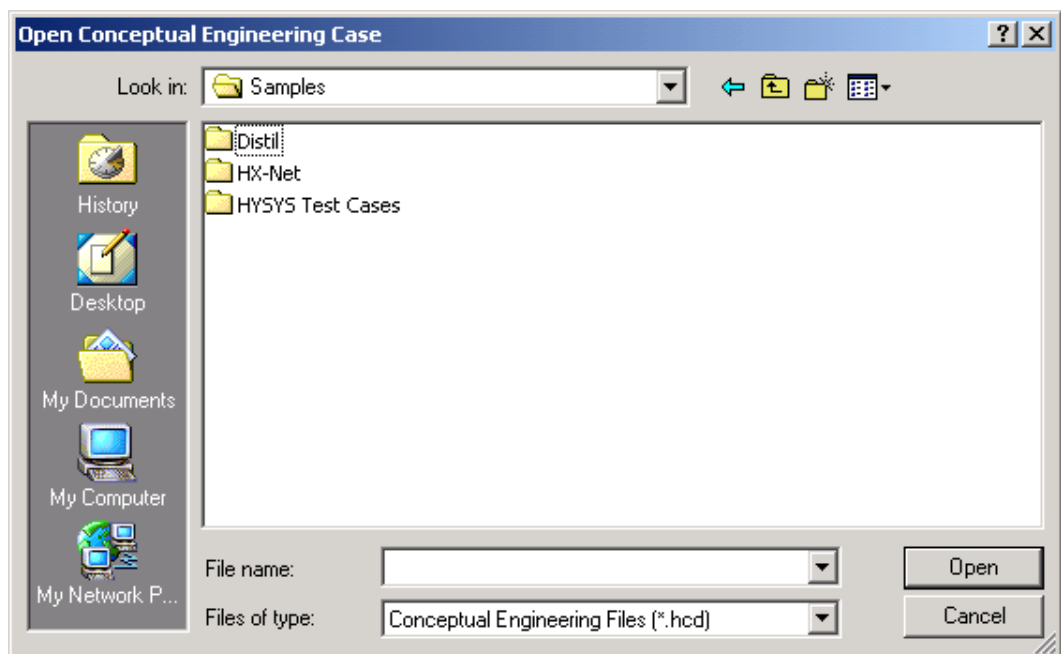
1 Open a case using one of the following three methods:

- On the toolbar, click the **Open Case**  icon.
- On the **File** menu, click **Open**.
- Press **CTRL O**.

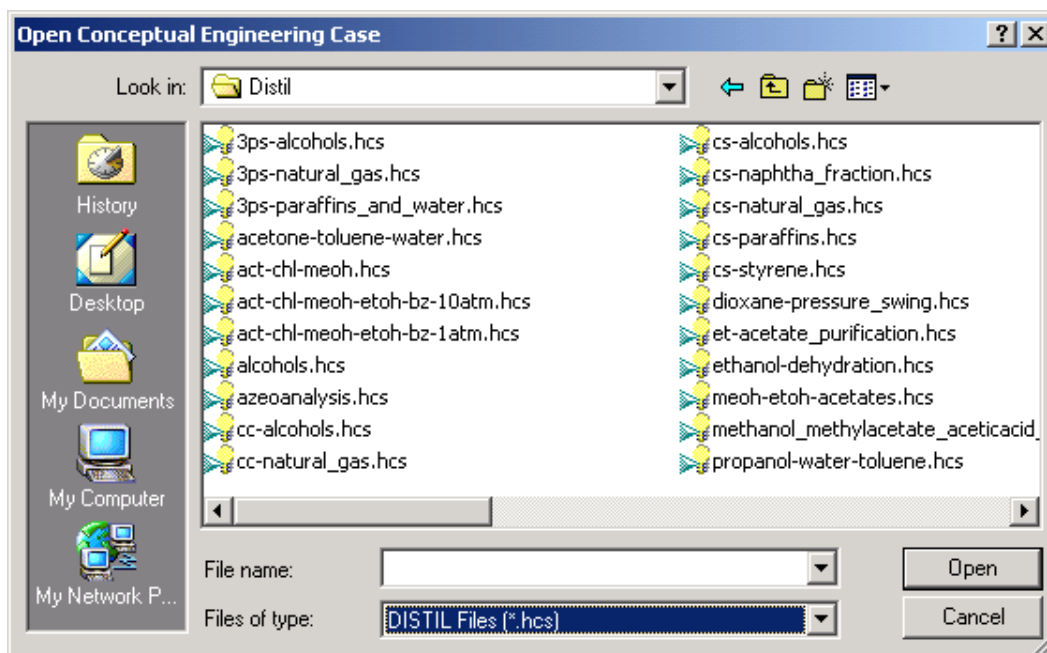
The **Open Conceptual Engineering Case** view appears.



2 In the **Look in** list, find and open the **Samples** folder.



3 Double-click the program folder you want to select a case from. The figure here shows the sample cases for DISTIL.




4 Select a case; then click **Open**.

The pre-built case appears on your desktop.

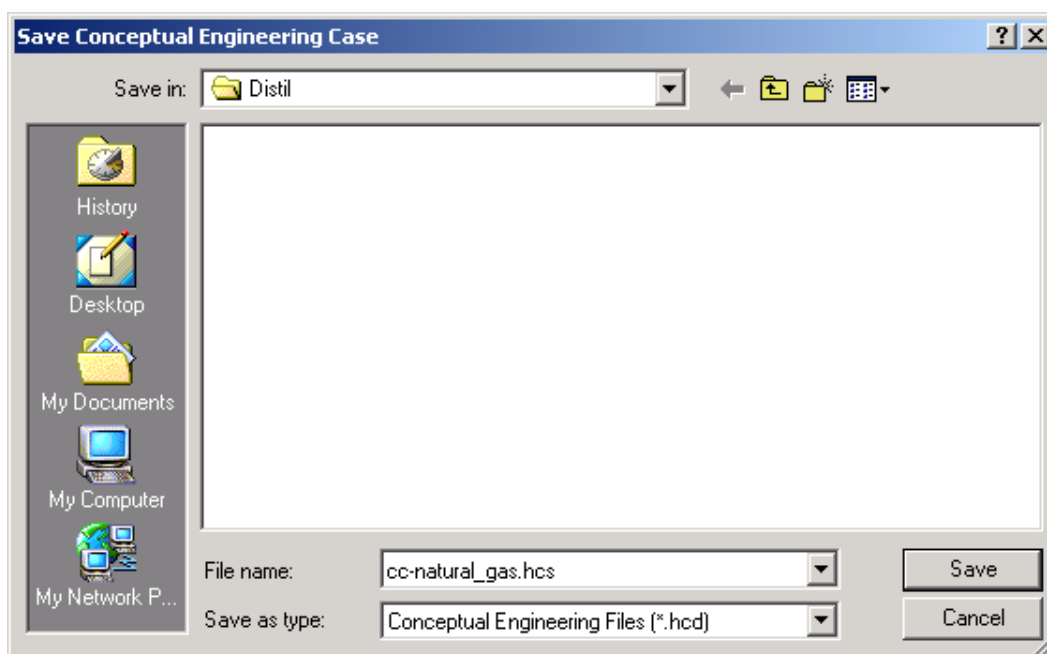
Saving the Sample Case Under a New Name

Before working with the case, you should save it using a new name to ensure that the original file remains intact.

1 Save the case using one of the following three methods:

- On the toolbar, click the **Save Case** icon .
- On the **File** menu, click **Save As**.
- Press CTRL SHIFT S.

The **Save Conceptual Engineering Case** view appears.



- 2 In the **Save in** list, find the location where you want to save the case.
- 3 In the **File name** field, type a new name, for example, **MYCASE**.
- 4 Click **Save**.


The Conceptual Engineering Product saves your case with the new name.

Distillation Case

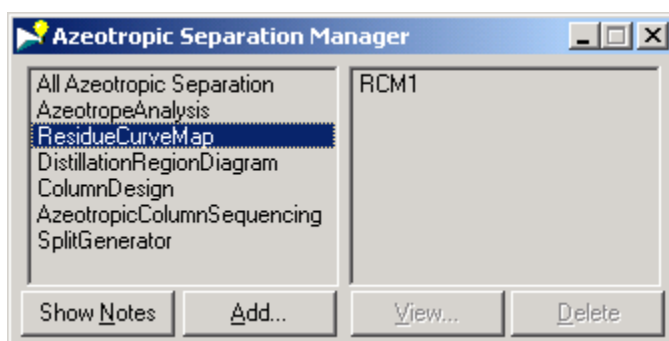
In this Getting Started example, you will examine the distillation region diagram of the water-ethanol-benzene system.

Opening a Residue Curve Map View

The fundamental parts of the **Residue Curve Map (RCM)** operation are multi-component azeotrope calculations, residue curve calculations, and distillation boundary calculations.

- 1 Follow the instructions in **Starting Conceptual Engineering Products** to start DISTIL.
- 2 Open the DISTIL case **rcm-wat- eth-benz.hcd**; then save the case under a different name.
- 3 Open the Azeotropic Separation Manager if it is not open when you open the case using one of the following two methods:
 - On the **Managers** menu, click **Azeotropic Separation Manager**.
 - On the toolbar, click the **Azeotropic Separation Manager**  icon.

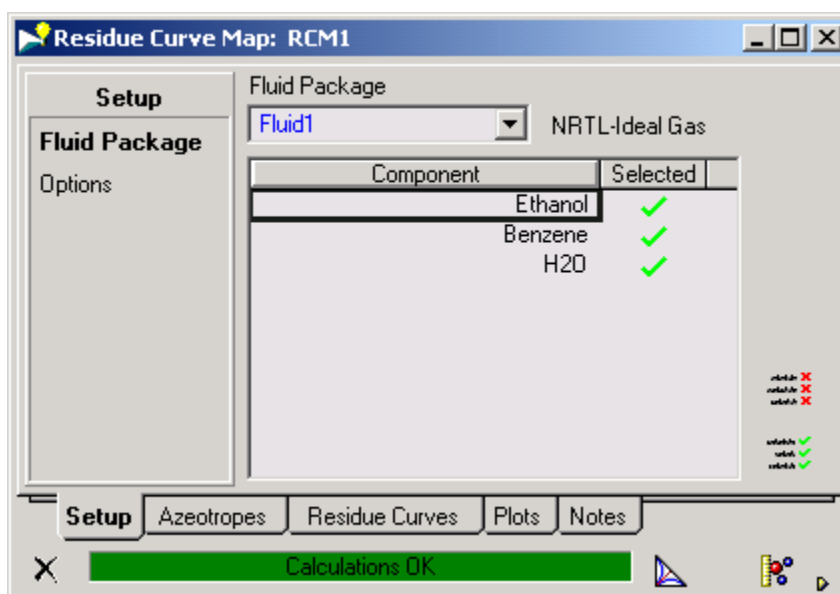
The **Azeotropic Separation Manager** view appears.



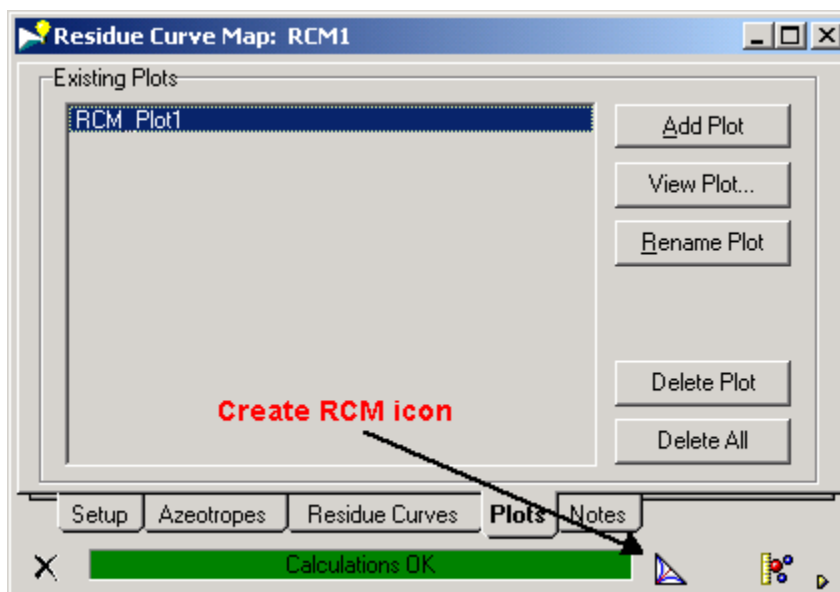
4 In the **Azeotropic Separation Manager** view, from the list on the left, select **ResidueCurveMap**.

5 From the list on the right, click **RCM1**; then click **View**.

The **RCM1** view appears.



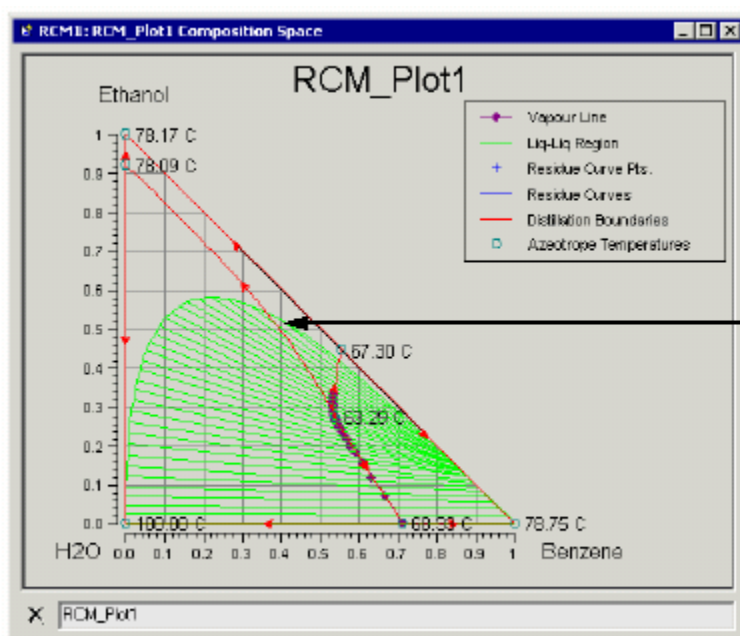
6 Click the **Plots** tab.



7 From the list, click **RCM Plot1**.

8 Click **View Plot** in order to view the RCM plot for this ternary system.

The **RCM Plot1** view appears as shown in the figure below.



The liquid-liquid region of the ternary system appears in the RCM Plot.

On the **RCM** plot here the following are displayed:

- The vapor line which indicates the composition of vapor in equilibrium with the two liquid phases.
- The azeotropes and distillation regions of the system. There are four azeotropes and three distillation regions calculated in the ternary system.
- The temperature at which the azeotropes and distillation occur.

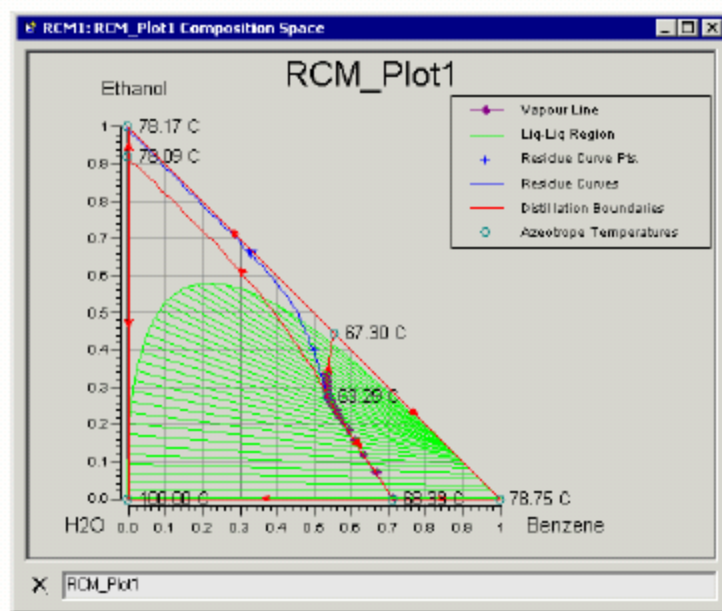
9 On the **RCM1** view, click the **Residue Curves** tab.


10 In the ***New*** column, specify the following composition for the residue curve initial point:

For this material	specify
Ethanol	.4
Benzene	.5
H2O	.1

The Conceptual Engineering Product automatically calculates the residue curve that contains the initial points you specified.

The **RCM Plot1** view appears as shown here.



11 Click the **Close** icon  to close the RCM Plot1 view.


You have now completed the Distillation case example.

You can save this case by doing one of the following:

- On the **File** menu, click **Save**.
- Press CTRL S.

- On the toolbar, click the **Save Case** icon .

To exit DISTIL

- On the **File** menu, click **Exit**.
-or-
- Press ALT F4.
-or-
- Click the **Close** icon  at the top right corner of the your Desktop.

Converting a HI Case to a HI Project

Note: Depending on the license you have for the Conceptual Engineering Product, you may not be able to perform the steps in this Getting Started example.


A Heat Integration (HI) Project can be used to design multiple heat exchanger networks. With the HI Project, you can specify various process and utility stream operating parameters and observe the changes on plots.

In this Getting Started example, you will convert a Heat Integration (HI) Case into a HI Project.

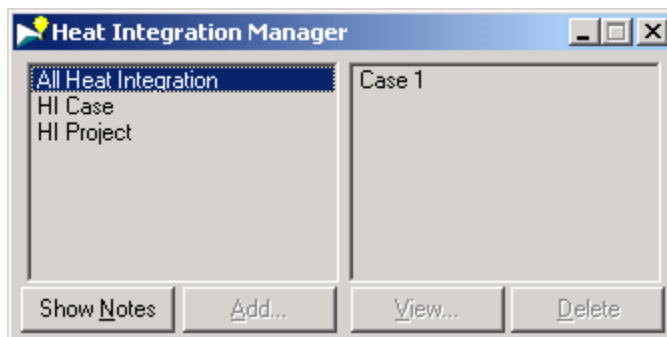
Warning: The command to convert HI Case into HI Project is irreversible. A HI Case can be converted to a HI Project, but a HI Project cannot be converted back into a HI Case.

- 1 Follow the instructions in Error! Reference source not found. to start HX-Net.
- 2 Open the old HX-Net case **case9s.hch**; then save the case under a different name.

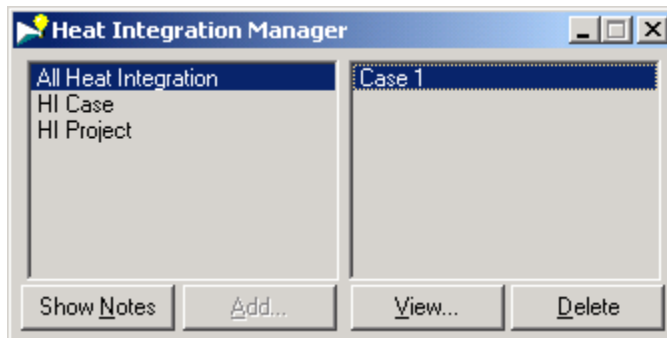
To open an old HX-Net case

- On the **Open Conceptual Engineering Case** view, from the **Files of type** list, select **HXNET Files (*.hch)**.
- 3 If the Heat Integration Manager is not open when you open the case, open it using one of the following two methods:
 - On the **Managers** menu, click **Heat Integration Manager**.
 - On the toolbar, click the **Heat Integration Manager**  icon.

The **Heat Integration Manager** view appears.

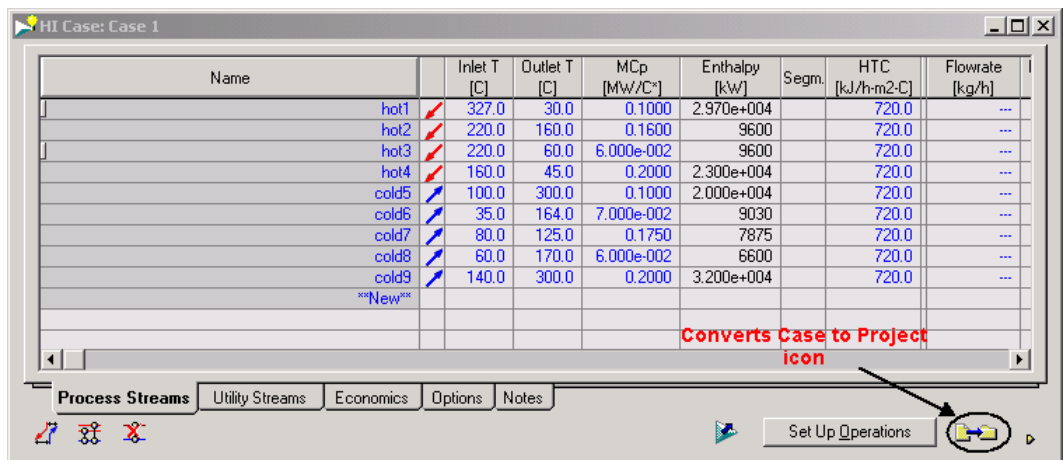


- 4 On the **Heat Integration Manager** view, from the list on the right, click **Case 1**.

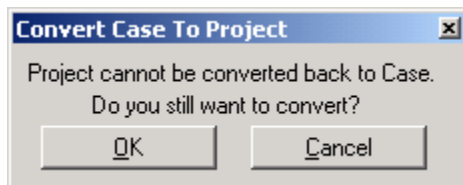


5 Click **View** to open the **HI Case** view.

6 At the bottom right corner of the **HI Case** view, click the **Converts Case To Project**  icon.

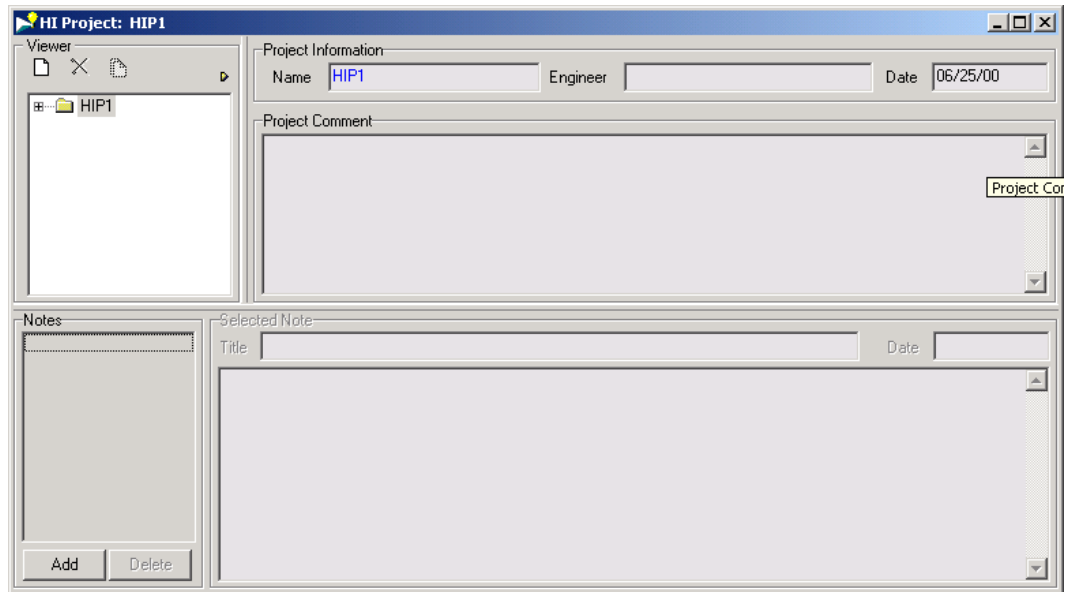


The **Convert Case To Project** view appears with a message asking if you want to convert the case to a project.



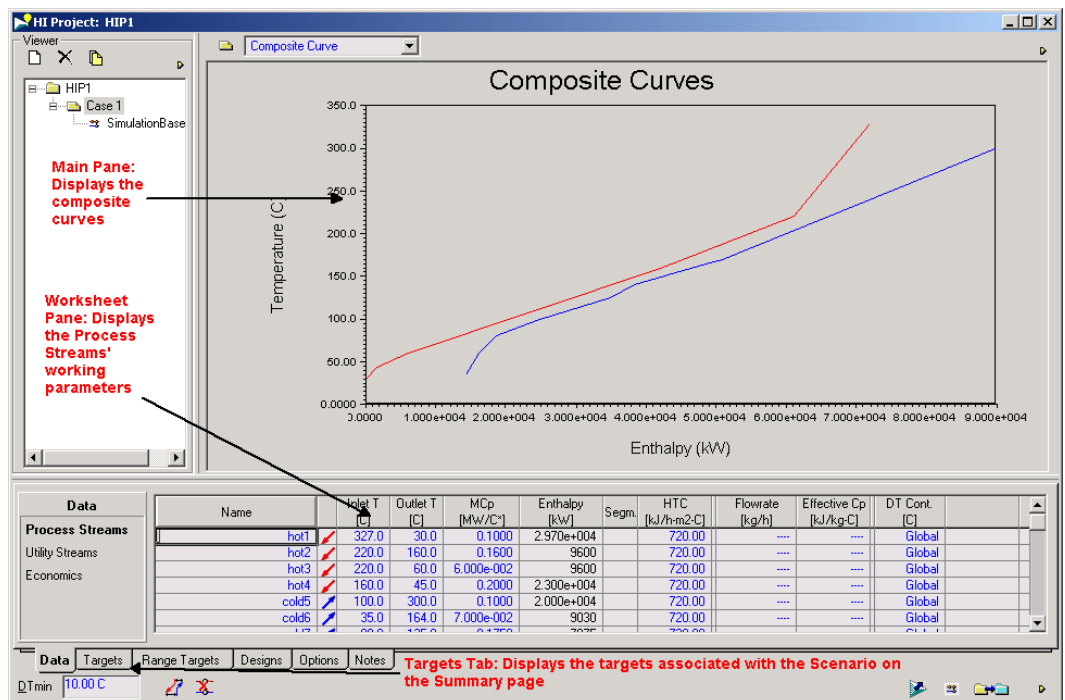
7 Click **OK**.

The **HI Project** view appears.



8 Click the PLUS SIGN to the left of **HIP1** to display **Case 1**.

9 In the **Viewer** pane in the **HI Project** view, click **Case 1**.



The **Data** tab displays all process streams information on the **Process Streams** page, and all utility streams information on the **Utility Streams** page.

On the **Main** pane, you can also observe the

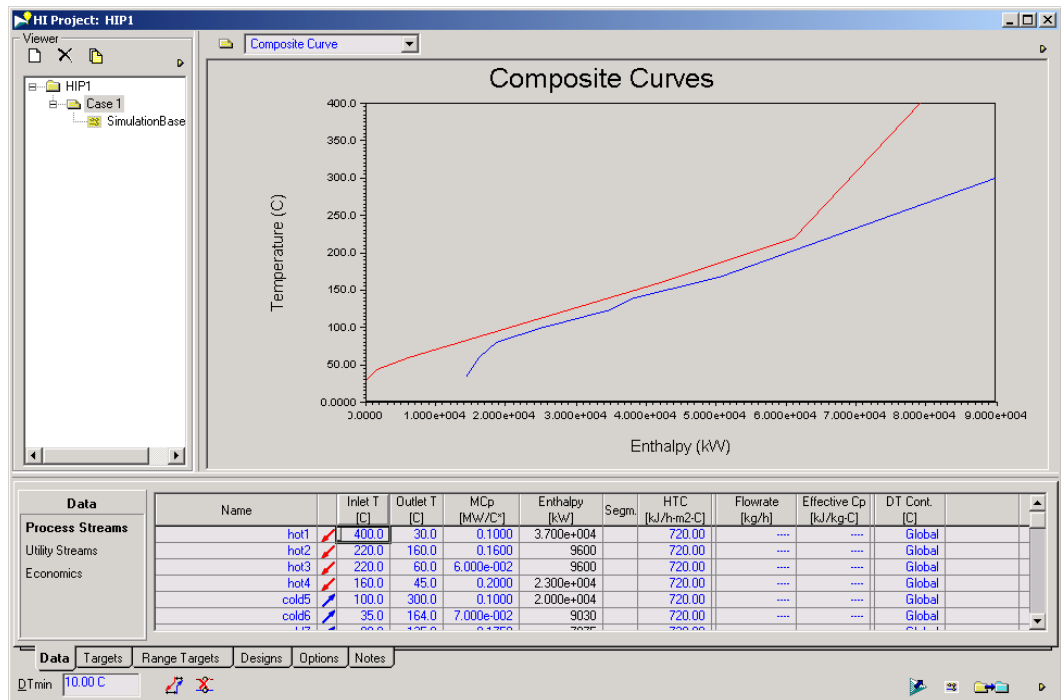
- Composite Curves.
- Grand Composite Curve.

- Alpha Plot.
- General Plot.

Manipulating Data in the Heat Integration Project

Suppose you want to investigate the effect of increasing the inlet temperature of the first hot process stream (**hot1**) on the composite curves. The inlet temperature of the stream **hot1** is currently specified as 327°C.

- 1 On the **Process Streams** page, select the **Inlet T** cell for the **hot1** stream.
- 2 Type **400**; then press ENTER.



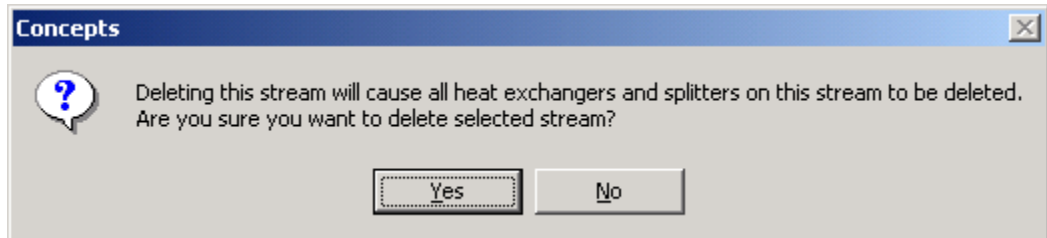
Modifying the inlet temperature of **hot1** causes the hot composite curve to change. Consequently, HX-Net recalculates all target values and the new results are automatically updated. A new set of pinch temperatures are displayed as well.

- 3 To view these changes, click the **Targets** tab.
- 4 At the bottom left corner of the view, click in the **DTmin** field.
- 5 Change the **DTmin** from **10°C** to **15°C**.
- 6 Click the **Options** tab.
- 7 In the **Utility Load Allocation Method** group, select the **Cheapest Utility Principle** method.
- 8 Click on the **Data** tab; then click the **Utility Streams** page.

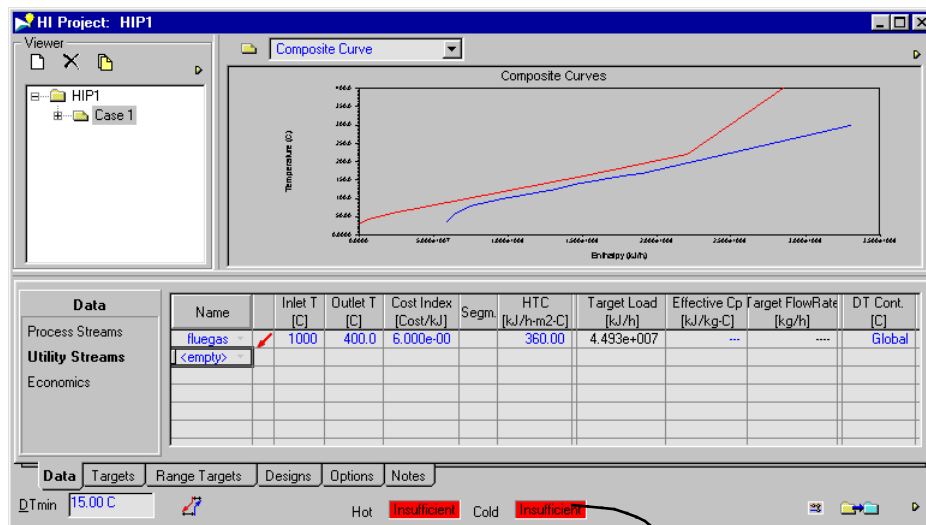
9 Select the **Name** cell of the **cw** stream.

10 Press DELETE.

HX-Net displays the following warning.



11 Click **Yes**.



The hot and cold utility status group changes from **Sufficient** (green) to **Insufficient** (red). Since the cold utility stream no longer exists, no utility streams can meet the Process Streams' cooling requirements. Consequently, the *Area* and *Nmin* targets from the Targets tab can no longer be calculated and the displayed value is zero.

12 Create a cold utility stream with the following specifications:

In this field	enter
Name	cold water
Inlet T	5°C
Outlet T	6°C
Clean HTC	9360 kJ/hm ² C
DT Cont.	5°C

Once you have specified the cold water utility on the Utility Streams page, the hot and cold utility status bar changes from *Insufficient* to *Sufficient*.

13 Click the **Data** tab; then click the **Economics** page.

Name	a	b	c	HT Config
DEFAULT	1.500e+03	1000	0.8300	Heat Exchanger
New				

Rate of Return (%): 10.00 ROR
 Plant Life (years): 5.000 PL
 Annualization Factor= (1 + ROR/100)^PL/PL

Capital Cost Index(Heat Exchanger) [Cost] = a+b(HeatExch Area/Shells)^c*Shells
 Capital Cost Index(Fired Heater) [Cost] = a + b(Fired Heater Duty)^c

Q Tmin: 15.00 C


The **Heat Exchanger Capital Cost Parameters** group is a matrix of cost set/law data.

14 Select the **a** cell from the **Default** cost law. Type **2500**, and press **ENTER**.


15 Click the **Targets** tab; then click the **Summary** page and observe the changes in cost.

You have now completed the HI Project example. You can save this case by doing one of the following:

- On the **File** menu, select **Save**.
- Press CTRL S.

- On the toolbar, click the **Save Case** icon .

To exit HX-Net, use one of the following three methods:

- On the **File** menu, click **Exit**.
- Press ALT F4.
- At the top right corner of the your Desktop, click the **Close** icon .