

# **Engineering Base**

# **Aspen Simulation Import**

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#### AUCOTEC AG

Oldenburger Allee 24 D-30659 Hannover Phone:+49 (0)511 61 03-0 Fax: +49 (0)511 61 40 74

www.aucotec.com

## AUCOTEC, INC.

2701 Troy Center Drive, Suite 440 Troy, MI 48084 Phone: +1 630 485 5600 Fax: +1 248 655 7800

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# **1** The Aspen Simulation Import Assistant

# **1.1** General Information

Using the Aspen Simulation Import Assistant, you can import data created by an Aspen simulation into Engineering Base.

The data containing information on devices, pipelines, pipeline segments and flow streams can be allocated to the corresponding Engineering Base types and attributes via mapping tables. Characteristics and their respective characteristic points can also be imported.

To enable the assistant to analyze and import the Aspen simulation data, this data must be available in XML format.

You can view the structure of the data to be imported and verify the mapping to the Engineering Base attributes by means of a preview dialog. For the blocks and flow streams contained therein, the attributes and the attribute contents are displayed.

# **1.2** Prerequisites

This assistant can only be used with the following licenses:

- EB Basic Engineering
- EB Plant Engineering
- EB Plant Engineering (Campus)

To enable the import of objects via the **Aspen Simulation Import**, the option **Plant Engineering and Instrumentation Context** must be selected in the **Project properties/General/Project Context**.

A specification catalog has to be allocated to the project. In the catalog properties, the option **Show Chemicals** must be selected under **View/Settings**.

# **1.3** The Outcome of the Import

- Devices, pipelines and pipeline segments are imported and saved into a predefined subfolder of the Equipment folder.
  - 🗉 🚺 Unit Operations
    - - 🗉 🌗 New Process Scenario xx
    - 🗉 🖯 COLUMN
    - COMPRSOR
    - 🗉 🔂 COND0

    - 🗉 🔂 EVAP

    - ⊞ 人 MIX1
    - ⊞ പ MIX2
    - 🗉 🛇 PUMP

If an already imported device is imported again via another subordinate process scenario, a device state with the respective data is created below the device. • Flow streams and their chemical components are imported and saved into a predefined subfolder of the Equipment folder.



If an already imported flow stream is imported again via another subordinate process scenario, a flow stream state with the respective data is created below the flow stream.

• The chemical components of which the flow streams are composed are stored in the respective Specification catalog / Chemicals.



- Characteristics and their corresponding characteristic points are imported and saved at the related Engineering Base object.
  - 🗉 😚 HEATER

# **1.4** User interface

#### To start the Aspen Simulation Import Assistant

- 1. In the Engineering Base Explorer, select a **Process Scenario** from the folder **Pro-cesses** .
- 2. On the shortcut menu, click **Select Assistant**, select the assistant **Aspen Simula-tion Import**, and click **Run**.

This opens the **Aspen Simulation Import** dialog.

Aspen Simulation Ir	nport (2.4.14.0)				-	Х
Aspen XML		ect Aspen XML fil	e or a folder			
Mapping name	Ne	w mapping test				
Options						
<ul> <li>Import simulation</li> </ul>	(will override existin	g objects!)				
O Import and update	e simulation (with de	lta management)				
O New Process Scen	ario		New Proce	ss Scenario		
Unit Operation folder	Unit Operations					
Flow Stream folder	Mass Balance					
Ask for the status	information					
Use Status attribute name				Status attribute value		
Discipline pha	se					
Data Version						
Status 1						
Status 2						
Status 3						
Status 4						
Status 5						
Data created/changed by						
Creation / change date				03.07.2018		
Assigned to						
Due date				03.07.2018		
Priority of the change						 _
Quality Check						

3. Under **Aspen XML**, select one or several Aspen simulation XML file(s) to be imported. Clicking the button .... opens the file selection dialog for files or folders

(containing Aspen simulation XML files).

4. Under **Mapping name**, select the mapping to be used for the import via the dropdown menu.

A new mapping can be created via the button <u>Mapping Configuration</u>.

The configuration files are stored in the project below **Templates/Configurations** /Aspen Simulation Import

- 5. Select one of the following options:
  - Import Simulation: The simulation data is imported. Objects already existing in Engineering Base are overwritten.
  - Import and update simulation (with Delta Management): The simulation data is displayed in a preview. Already imported data of a simulation may be updated.
  - New Process Scenario: The Aspen simulation data is imported into a new process scenario that is stored below the start object.
- 6. Below the **Folder Unit Operations**, select a subfolder of the Equipment folder to which the devices, pipelines and pipeline segments are to be saved. **Unit Operations** is preset as standard.

Click — and select the folder of your choice in the **Select Item** dialog.

7. Below the **Folder Flow Stream**, select a subfolder of the Equipment folder to which the flow streams are to be saved. **Mass Balance** is preset as standard.

Click and select the folder of your choice in the **Select Item** dialog.

8. Mark **Ask for the status information** if you want to transfer status information (status attributes) during the import.

In the table of available status attributes, mark those status attributes in the column **Use** that are to be saved at the imported objects. Enter the values of your choice into the marked status attributes.

After the import, these attributes are displayed at the imported object on the tab **Status**.

- 9. Click the button <u>Mapping Configuration</u> to create a new mapping that specifies the import options.
- 10. Click **Next** to start the import of the Aspen simulation data or to view the preview pane.



This button is only active once the Aspen XML file, the mapping configuration and an option are selected.

**Cancel** terminates the assistant.

#### Options

Option	Meaning				
Import simulation (will override existing objects)	The data of the Aspen simulation is written into the process scenario that the assistant was started on.				
	The imported flow streams and objects are stored in the equipment subfolders defined under <b>Folder Unit Operations</b> and <b>Folder Flow Stream</b> .				
	Previously imported data with respective information in the Aspen mapping attribute is overwritten!				
	After the import, the assistant terminates.				

Import and update simula- tion (with Delta Manage- ment)	Before the import, the Aspen simulation data is ana- lyzed and compared to the data already existing in the project. As a result, a preview dialog is displayed to show how the Aspen data has been mapped to the Engineering Base objects and whether there are any differences between the values to be imported and the already imported values. This option can also be started on an empty process scenario to verify whether the data allocation is cor- rect.				
New Process Scenario	Selecting this option, you can enter the name of the new process scenario into the input field. The Aspen simulation data is written into a new pro- cess scenario that is stored below the scenario the assistant was started on.				
	• The imported flow streams and devices are stored as flow stream and device states in the equipment subfolders defined under Folder Unit Operations and Folder Flow Stream.				
	<ul> <li>If the flow streams and devices already exist in the folders (the comparison is done using the values in the defined Aspen mapping attrib- ute), the imported data is stored as a state of the flow stream or the device.</li> </ul>				
	The newly saved states are also associated with the process scenario the assistant was started on.				
	<ul> <li>If no flow streams or devices with matching values in the defined Aspen mapping attribute have been saved in the selected folders yet, the imported data will be saved as flow stream and state or as device and state.</li> <li>The newly saved flow streams and states or devices and states are also associated with the process scenario the assistant was started on.</li> </ul>				

## 1.4.1 Mapping Configuration

In the **Mapping Configuration** dialog, you can define how the Aspen simulation data is to be transferred into Engineering Base data. You can create a new mapping or edit or delete an existing one.

The mapping configuration file is stored with its assigned name in the project properties under **Templates/Configurations/Aspen Simulation Import**.

) As	Aspen Simulation Import (2.4.9.0) – D X									
Мар	apping name New mapping v									
Asp	Den XML Select the Aspen X	(ML or a folder to load Aspen classe:	s and attributes Load XML							
Clas	s Mapping Attributes Map	pping Characteristic Attribute Map	ping							
	Aspen Plus Class	Engineering Base Type Category	Engineering Base Type							
1	BlockCompr	~ ·	v							
2	BlockFlash2	v	v							
3	BlockHeater	Ŷ	v							
4	BlockHeatx	Ý	×							
5	BlockMixer	, v	· ·							
6	BlockPump	Ý	v							
7	BlockRadfrac	Ý	v							
8	BlockRstoic	×	×							
Aspe	en mapping attribute (AID):	5	OK Apply Cancel							

To display the data of the Aspen XML file in the table, the XML file has to be loaded.

- 1. Under **Mapping name**, select the mapping to be used for the import via the dropdown menu, or create a new configuration file.
- 2. Under Aspen XML, select one or several Aspen simulation XML file(s) to be im-

ported. Clicking the button we opens the file selection dialog for files or for folders containing Aspen simulation XML files.

3. Click **Load XML** to load the data of the simulation file and to have the data displayed in the table.

The data of the Aspen simulation XML file is displayed in 3 tables that can be selected via the respective tabs.

- 4. In the tables **Class Mapping**, **Attributes Mapping** and **Characteristics Mapping**, assign the respective objects in Engineering Base to the Aspen data.
- 5. Click **OK** to return to the start dialog of the assistant.



If, on ending the dialog, any errors are detected in the mapping tables, they will be listed in an error dialog. The detected errors can be copied into the clipboard to facilitate the corrections in the mapping tables.

Mapping name	Select the mapping to be used for the import via the drop-down menu. Clicking the button opens the shortcut menu.				
	Add New Mapping	A dialog opens enabling you to enter the name of the new map- ping configuration. Click <b>OK</b> . Click <b>Apply</b> to save the configu- ration file.			
	Edit Name	A dialog opens enabling you to change the name of the mapping configuration. Click <b>OK</b> . Click <b>Apply</b> to save the name change.			
	Delete Mapping	If you confirm the confirmation prompt, the currently displayed mapping configuration is de- leted.			
Aspen XML	Select one or several Aspen simulation XML file(s) to be imported. Clicking the button opens the file selection dialog for files or for folders containing Aspen simulation XML files.				
Load XML	The data of the selected Aspen XML files is now analyzed by the assistant and displayed in the tables <b>Class Map- ping</b> , <b>Attributes Mapping</b> and <b>Characteristics Map- ping</b> .				

#### Meaning of columns and input fields

Aspen mapping attribute (AID)	The standard setting of this attribute is 5. This is the at- tribute ID of the name or the device designation of an object in Engineering Base.				
	This means that, with the standard setting $AID = 5$ , to names of the devices and flow streams of the Aspen ulation XML file are written into the names or the de designations of the imported objects in Engineering E				
	Via this at has alread	tribute, the assistant verifies whether an object ly been imported.			
		If you change the device designation or the name of an imported object, the assistant can no longer recognize it as an imported object. New objects are then created, as it is no longer possible to update the existing ob- jects via the import.			
	<b>?</b>	If you allocate a different value to the attrib- ute, the names of the objects from the As- pen simulation XML file are written into this attribute. This allows you to change the name of the EB object and to update the ob- ject without creating a duplicate or a new object in case of repeated imports.			

#### Meaning of the buttons

ок	Ends the dialog and saves all changes made. The dialog from which the mapping configuration was started is displayed again.
Apply	Once you have confirmed the confirmation prompt, the changes are saved in the configuration file. This also applies if the dialog is terminated with <b>Cancel</b> .
Cancel	Ends the dialog. All changes that have not been saved via <b>Apply</b> are discarded. The dialog from which the mapping configuration was started is displayed again.

## 1.4.1.1 Table Class Mapping

In this table, you can assign the Aspen device types to EB object types.

<b>()</b> As	Aspen Simulation Import (2.4.9.0) – 🗆 🗙							
Мар	Mapping name New mapping ~							
Asp	Aspen XML Select the Aspen XML or a folder to load Aspen classes and attributes Load XML							
Clas	s Mapping	Attributes Mapp	ing Characteristic Attribute Mapping					
	Aspen Plu	us Class	Engineering Base Type Category Engineering Base Type					
1	BlockCom	ıpr	Device   Compressors, vacuum pumps, blowers, fans (Pro	ocess / Fluid)	~			
2	BlockFlas	h2	Device v Vessels, tanks, bins, silos (Process / Fluid)		~			
3	BlockHeat	ter	Device v Heat exchangers (Process / Fluid)		~			
4	BlockHeat	tx	Device v		~			
5	BlockMixe	er	Device ~		v			
6	BlockPum	р	Device v Pump (Process / Fluid)		~			
7	BlockRadt	Radfrac Device v Valve, general (Process / Fluid)			~			
8	BlockRsto	ic	×		¥			
	•		. т					
Aspe	Aspen mapping attribute (AID): 5 OK Apply Cancel							

- 1. Assign the respective global EB type (**Engineering Base Type Category**) to the **Aspen Plus Class** from the selection list.
- 2. Then, select the corresponding object type (**Engineering Base Type**) from the selection list.



Aspen Plus classes which are not to be considered in the mapping table can be deleted via the option **Delete Row** of the context menu.

Numbering	The Aspen device types found are displayed in a num- bered list.		
Aspen Plus Class	The Aspen Plus classes found are displayed in an alpha- betical order.		
•	By clicking the header line, the sorting can be changed.		
	The global Engineering Base types are offered for selec- tion in a drop-down list.		
	They are:		
Engineering Base Type	Device		
	Function		
	Pipeline		
	Pipeline Segment.		
Engineering Base Type	The Engineering Base object types which are available for the selected global Engineering Base Type are offered for selection in a drop-down list.		

#### The columns and their meaning

## 1.4.1.2 Table Attribute Mapping

In this table, the Aspen attributes can be assigned to Engineering Base attributes.

i Asp	Aspen Simulation Import (2.4.9.0) — — X									
Марр	Mapping name New mapping ~									
Aspe	Aspen XML Select the Aspen XML or a folder to load Aspen classes and attributes Load XML									
Class	Class Mapping Attributes Mapping Characteristic Attribute Mapping									
	Aspen Plu	is Class	Aspen Attribute	name	Attribute name					
1		~	B_K							. ^
2		~	B_PRES							
3		~	B_PRES_IN		Pressure					
5		~	B_TEMP							
4	Heater	~	B_TEMP		Design Temperature					
6		~	B_TEMP_IN							
217		~	MASSFLOW		Mass Flow					
235		~	MOLEFLOW		Mole Flow					
358	Heater	~	TEMP_OUT		Temperature					
Asper	Aspen mapping attribute (AID): 5 OK Apply Cancel									

- 1. Select the **Aspen Plus Class** of the **Aspen attribute** to which the Engineering Base attribute is to be assigned.
- 2. Next, select the Engineering Base attribute (**Attribute name**) from the selection list.

The row is duplicated to enable you to allocate the Aspen attribute to another Aspen Plus Class and to assign it to another Engineering Base attribute, if required. On the shortcut menu of a row, the following options can be selected:

Delete Row	The entire row will be deleted from the mapping table. The numbering in the first column will be adjusted ac- cordingly.			
Duplicate Row	The row will be duplicated. The numbering in the first column will be adjusted ac- cordingly.			
Insert Row	A new row will be inserted below the row. The numbering in the first column will be adjusted ac- cordingly. Depending on whether the sorting in column <b>Aspen at-</b> <b>tribute name</b> is activated or not, the empty row is dis-			

#### The columns and their meaning

Numbering	The Aspen attributes found are displayed in a numbered list.			
Aspen Plus Class	If an Aspen attribute is used for several Aspen device types, you can select the Aspen Plus class of your choice in this column. The respective classes are offered for se- lection in a drop-down list. A new row is automatically created if an Aspen Plus class is selected. Hence, it is possible to assign Aspen attributes of different classes to attributes of different EB types.			
Aspen Attribute name	The determined Aspen attributes will be displayed in al- phabetical order. By clicking the header line, the sorting can be changed			
Attribute name	<ul> <li>Clicking the button opens the shortcut menu.</li> <li>Remove attribute mapping The selected Engineering Base attribute in this row i deleted.</li> <li>Add attribute mapping The dialog <b>Please select the attribute</b> is dis- played, enabling you to select an Engineering Base attribute. If you confirm your selection with <b>OK</b>, the</li> </ul>			

#### 1.4.1.3 Table Characteristics Mapping

In this table, attributes containing a number of values (e.g. curve, profile) can be mapped to specific Engineering Base attributes, the so-called Characteristics (Characteristic and Characteristic point). A characteristic consists of a number of characteristic points.

i Asp	Aspen Simulation Import (2.4.9.0) – $\Box$ X							×	
Mapp	Mapping name New mapping								
Aspe	Aspen XML Select the Aspen XML or a folder to load Aspen classes and attributes Load XML								
Class	Class Mapping Attributes Mapping Characteristic Attribute Mapping								
	Characte	ristic Attribute	Aspen	Attribute name	Characteristic name	Characteri	stic Point name		
79			RXNID					,	~ ^
80			SIGMA	MX_PNH				,	~
81			TEMP					,	-
82	<ul> <li>✓</li> </ul>		TEMP_	OUT	HCURV_NO	NPOINT		,	-
83			TEMP_	OUT2		•		,	-
Aspen mapping attribute (AID): 5 OK Apply Cancel									

- 1. Check the check box in column **Characteristic Attribute** if the attribute in column **Aspen Attribute name** is to be saved as a characteristic.
- 2. Via the selection list in column **Characteristic name**, select which values are to be entered as **Characteristic** in Engineering Base. Via the selection list in column **Characteristic Point name**, select which values are to be entered as **Characteristic Points**.

In Engineering Base, the **Characteristic** and **Characteristic Point** will then receive the names of the Aspen attributes.

Assigning Aspen **Characteristic Attributes** to characteristic attributes in Engineering Base is only possible if the Aspen attribute has been mapped to an Engineering Base attribute in table **Attributes Mapping**.

3. Click **OK** to save the changes in the mapping table and to return to the start dialog.

# **1.4.2** Import and update with preview dialog and delta management

In the preview dialog, the analyzed data of the Aspen simulation is displayed with its structure in a tree. For every block or simulation stream, it is possible to display the respective Aspen attributes with the data they contain and the values already imported into the Engineering Base project. Differences in the values are highlighted in yellow.

If an Aspen attribute is assigned to an Engineering Base attribute via the mapping, the name of the Engineering Base attribute is displayed in the column **Attribute**.

If an Aspen attribute contains the values of a characteristic, these values are displayed in a comma-separated list.

The mapping configuration can be opened from the preview pane to enable changes in the mapping, if required.

Aspen Simulation Import (2.4.9.0)						-		×
Process Scenario								
Aspen Simulation Data	· 🗸 A	Attributes	Aspen Value		Engineering Base	e Value		
	✓ B	3_K	0,08207					^
	🗸 B	PRES	0,9					
✓ ✓ COMPRSOR		Design Temperature	40		60C			
COND0	🖌 B	3_VFRAC	0					
COND1	🖌 B	BAL_ENTH_GEN						
+ ✓ COND2	✓ B	BAL_ENTH_OUT	-79062650,2					
	✓ B	BAL_FEEDCO2E	0					
+ ✓ MIX1	✓ B	BAL_MASG_FLW						
+ 🗹 MIX2	✓ B	BAL_MASG_TFL						
+ 🗹 PUMP	🖌 B	BAL_MASI_TFL	18015,28					
+ ✓ REACTOR	✓ B	BAL_MASO_FLW	18015,28					
	✓ B	BAL_MASO_TFL	18015,28					
	✓ 8	BAL_MASR_TFL	0					
🕨 🛨 🗹 CFEED	✓ 8	BAL_MOLG_FLW	0					
▷ 🛨 🗹 EVAPFEED	/ 🔽 B	BAL_MOLG_TFL	0					$\sim$
? Mapping Configuration				Impo	ort Update	Back	Ca	incel

- 1. Open the structure of the marked object of the Aspen data via a double-click.
- 2. Remove the mark for all objects that are not to be imported.

If the mark is removed at a superordinate object, the marks at the subordinate objects are also removed.

3. Click **Import Update** to import the selected Aspen data and to terminate the assistant.

#### Meaning of the icons

+	New Object. This Aspen simulation object does not yet exist in the En- gineering Base project.			
	Object existing in the Engineering Base project, identical attribute values.			
×	The Aspen simulation object has already been imported. No differences were detected between the values of the Aspen simulation values and the values already imported into Engineering Base.			
	Object existing in the Engineering Base project, data not identical.			
*	The Aspen simulation object has already been imported. Differences were detected between the attribute values of the Aspen simulation values and the values already imported into Engineering Base.			
	In the table, the row with the differing values is high- lighted in yellow.			

### Meaning of the buttons

Import Update	The import of the selected Aspen simulation data is started.		
Back	The dialog is closed and the start dialog of the assistant is displayed again.		
Cancel	Terminates the assistant.		