



# aPriori VPE Administration Guide

Version 2019 R2

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## Document Information

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# About This Guide

This section provides information about this Administration Guide, and the other ways in which aPriori supports the aPriori application.

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Key topics include:

- Overview
  - Related documents
  - Typographic conventions
  - Feedback and customer support
-

## Overview

This Administration Guide contains detailed information about using the tools in the virtual production environment (VPE) toolset to maintain the VPEs in your aPriori deployment.

## Related documents

In addition to this guide, you can find more information about the aPriori application in the following documents:

- *aPriori User Guide* – This guide contains detailed information about the aPriori solution. It is designed as a reference for your everyday work.
- *aPriori Cost Model Guide* – This guide contains detailed information about process groups and includes a chapter on direct and indirect overhead.
- *aPriori Cost Model Workbench User Guide* – This guide explains how to use aPriori's Cost Model Work Bench (CMWB) to customize cost models.
- *aPriori System Administration Guide* – This guide contains detailed information about administering the aPriori solution using the System Admin toolset. It is designed as a reference for aPriori system administrators.
- *Release Notes* – This document highlights the changes made in aPriori since the previous release. It also contains last minute information about the release.
- *Installation Guide* – This guide contains detailed information about installing aPriori.
- *System Requirements* – This document provides information on the minimum and recommended client and server requirements to run aPriori, as well as the CAD file formats supported by aPriori.

## Typographic conventions

The following conventions are used in this guide to convey additional information.

Style	Description	Example
Code	Code style is used for text that is used literally, appearing exactly as shown. This includes command names, path and file names, and system information.	E:\setup.exe
<i>Italic code</i>	Italic code style is used for names of variables that you must provide. For example, you need to supply a value for <i>your_file</i> in the path name example to the right.	C:\aPriori\ <i>your_file</i>
<b>GUI</b>	GUI style is used to indicate objects in the aPriori interface.	the <b>Document</b> field

<b>GUI Action</b>	GUI Action style is used to indicate objects in the aPriori interface that you click, select, or otherwise act upon.	Click <b>OK</b> .

**Note:** Notes highlight information, provide supplementary information, offer time-saving or easier ways to perform the same task, or explain how to prevent errors or data loss. Be sure to read this information carefully.

## Feedback and customer support

We appreciate your comments about this guide. Please contact us with your comments, questions, and requests for technical support.

Website: <http://www.apriori.com/support>

Email: [support@apriori.com](mailto:support@apriori.com)

# 1 VPE Administration Overview

This chapter provides a brief introduction to aPriori's Virtual Production Environment (VPE) and the role of a VPE Administrator.

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This chapter includes the following topics:

- Introduction
  - The VPE Toolset
  - Using the Search CSL utility
-



# Introduction to VPEs and administration

A Virtual Production Environment (VPE) represents a manufacturing facility by defining a set of virtual machines, workcenters, processes, process routings, and process groups. This representation includes definitions of the physical aspects of the environment (speeds, feeds, manufacturing times) as well as cost structure (labor rates, overheads, and so forth). Often, all of the elements of a VPE would be in one physical location, analogous to a factory. However, this may vary from customer to customer.

aPriori provides a set of Starting Point ("baseline") VPEs representing average costs of manufacturing in various geographic regions. You (or aPriori Professional Services) may also configure a VPE to represent your in-house manufacturing environment and cost structure, or a supplier's manufacturing environment and cost structure.

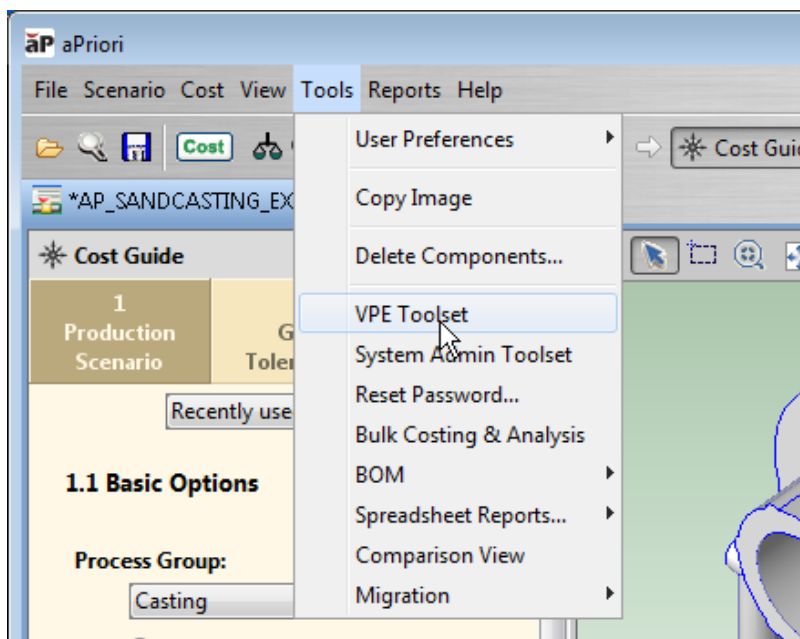
Updating and maintaining your company's VPEs requires at least one individual to serve as a VPE Administrator: this role has more privileges than a typical aPriori user, but not as many as a System Administrator. This document addresses those tasks that a VPE Administrator might be expected to perform. This document also includes a chapter devoted to administration of the separately-licensed Wire Harness module, since it is implemented as a special VPE (see Chapter 7, *Wire Harness and PCBA VPE*).

## The VPE Toolset

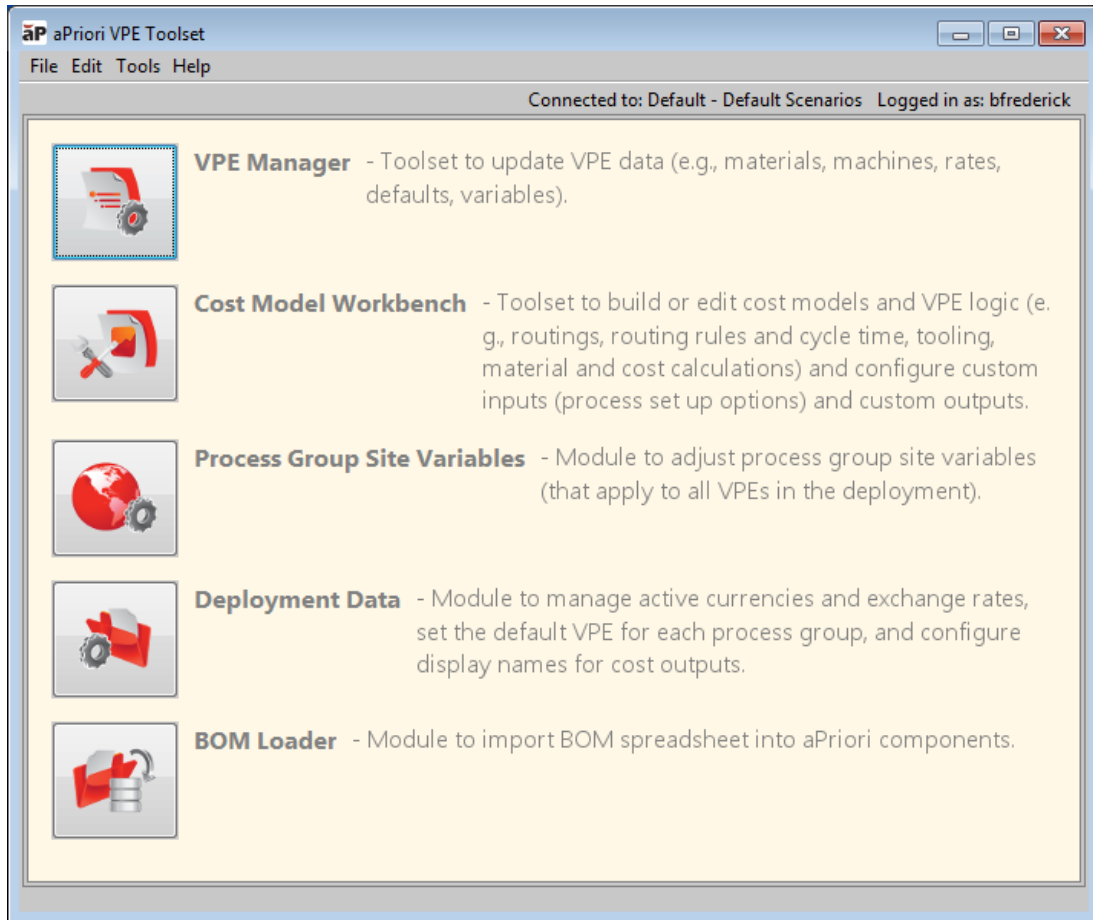
VPE-related features are accessed through the **VPE Toolset**, which is accessed from the Tools menu at the top of the main aPriori client.

### To access the VPE Toolset

- 1 In the aPriori client, click **Tools>VPE Toolset**.



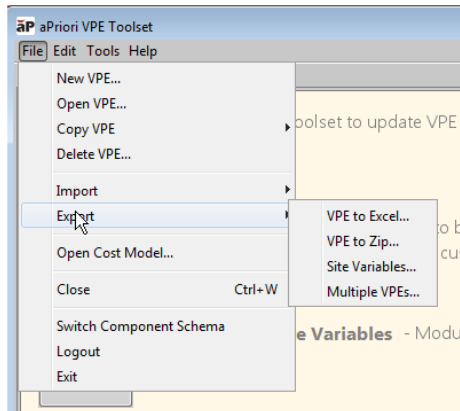
This displays the **aPriori VPE Toolset** window.



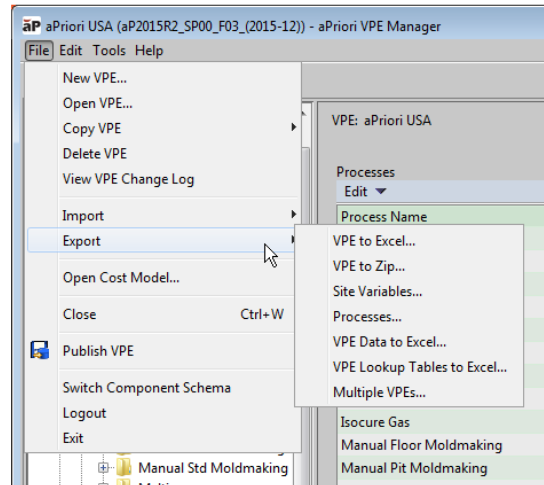
## 2 Use the VPE Toolset to access:

- **VPE Manager** – Use this tool to update VPE data, such as materials, machines, rates, defaults, and variables. This is covered primarily in the next chapter, *VPE Manager*.
- **Cost Model Workbench** – Use this tool to build or edit cost models, modify VPE logic, and configure custom inputs and outputs. This module is licensed separately and is documented in the aPriori *Cost Model Workbench Guide*.
- **Process Group Site Variables** – Use this tool to modify site variables for process groups, which impact how GCDs are analyzed by aPriori when it generates cost estimates for all the VPEs in the deployment. This is covered in Chapter 4, *Process Group Site Variables*.
- **Deployment Data Administration** – Use this tool to manage active currencies and exchange rates, set the default VPE for each process group, and configure display names for cost outputs. This is covered in Chapter 5, *Deployment Data Administration*.
- **BOM Loader** – Use this tool to import bills of materials and populate your aPriori database with components and cost data. This module is licensed separately. This is covered in Chapter 6, *BOM Loader*.

- 3 The **File** and **Tools** menus provide access to specific actions that are appropriate to your current location. Items on these menus are added and removed (or enabled and disabled) depending on where you are within the VPE Toolset options. For example, here are the options available on the **Files > Export** menu at the top level of the **VPE Toolset** window and the **VPE Manager**:



From VPE Toolset

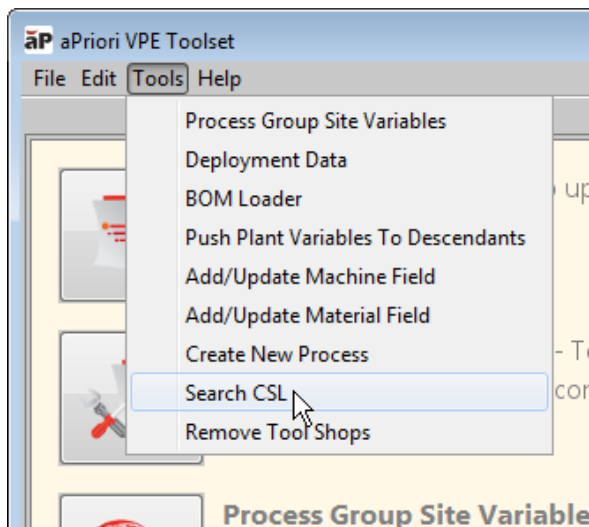


From VPE Manager

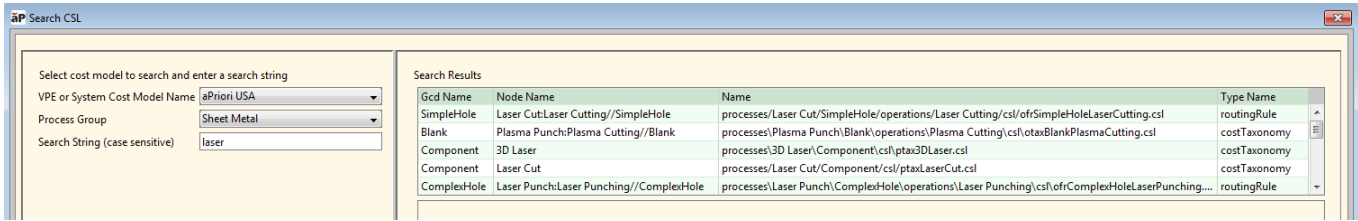
## Using the Search CSL utility

When working with VPEs and cost models, it can be useful to search through the cost model source files to find where things are defined. The **VPE Toolset** and **Cost Model Workbench** provide a **Search CSL** mechanism to find specific strings of code or text within a cost model.

- 4 From the toolbar of any **VPE Toolset** utility click **Tools > Search CSL**.



## 5 In the resulting **Search** dialog:



Provide values for:

- The name of the VPE or Cost Model to search
- The process group within the VPE or cost model to search
- The string to search for. The search is case sensitive.

As you enter text in the **Search String** field, aPriori instantly searches throughout the entire cost model, and returns in the right pane a list of all CSL files that include the specified string. Clicking on one of the entries displays the entire file in the lower-right pane.

This is particularly useful for tracing where certain formulas or settings are used in the cost model and can also be used to track down the specific code that creates a message seen in the application.

**Note:** This search does not include lookup tables, plant variables, or any VPE data (machine, material, tool shop, etc.).

## 2 VPE Manager

The aPriori VPE Manager allows you to update VPE data, such as machines, materials, rates, defaults, and variables. You can use it to create, open, import, export, and delete VPEs, as well as view a VPE's change log. You can also use it to add and delete machine and material data as well as edit that and other data contained within the VPE.

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This chapter includes the following topics:

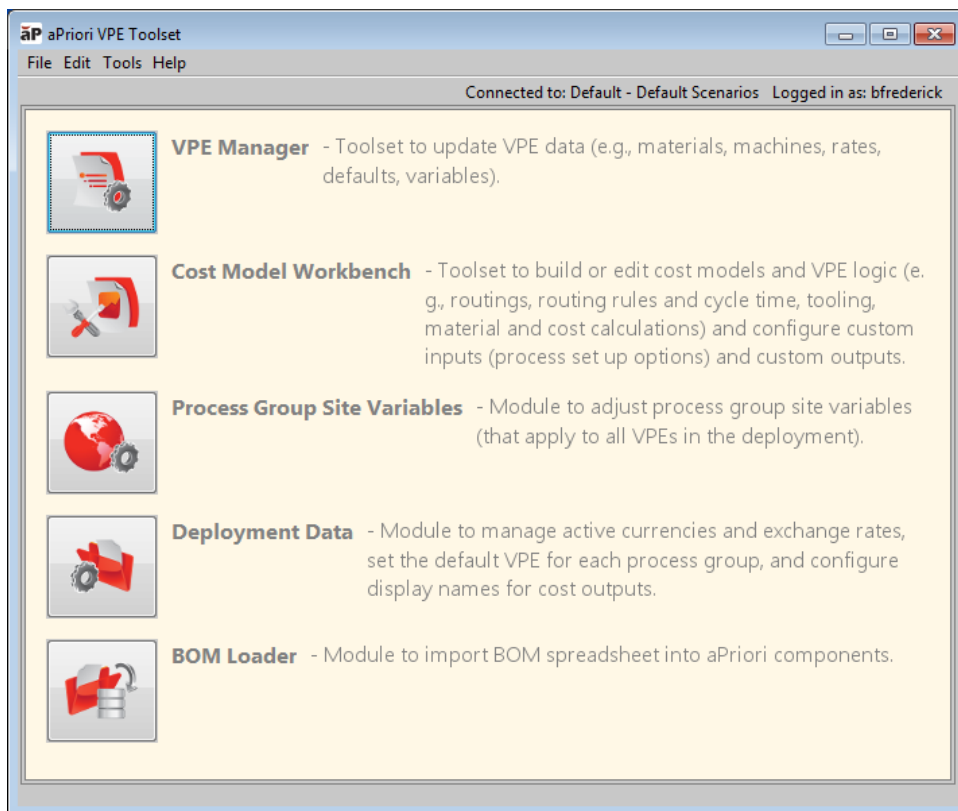
- Overview
  - Managing VPEs
  - Editing VPEs
  - Managing VPE cut code
-

## Overview of the VPE Manager

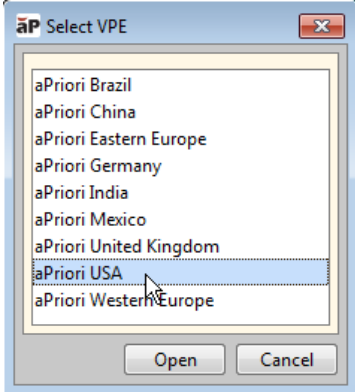
The aPriori VPE Manager allows you to manage VPEs and edit the data contained in each VPE. For more information, see *Managing VPEs* on page 8 and *Editing VPEs* on page 48.

### To start the VPE Manager

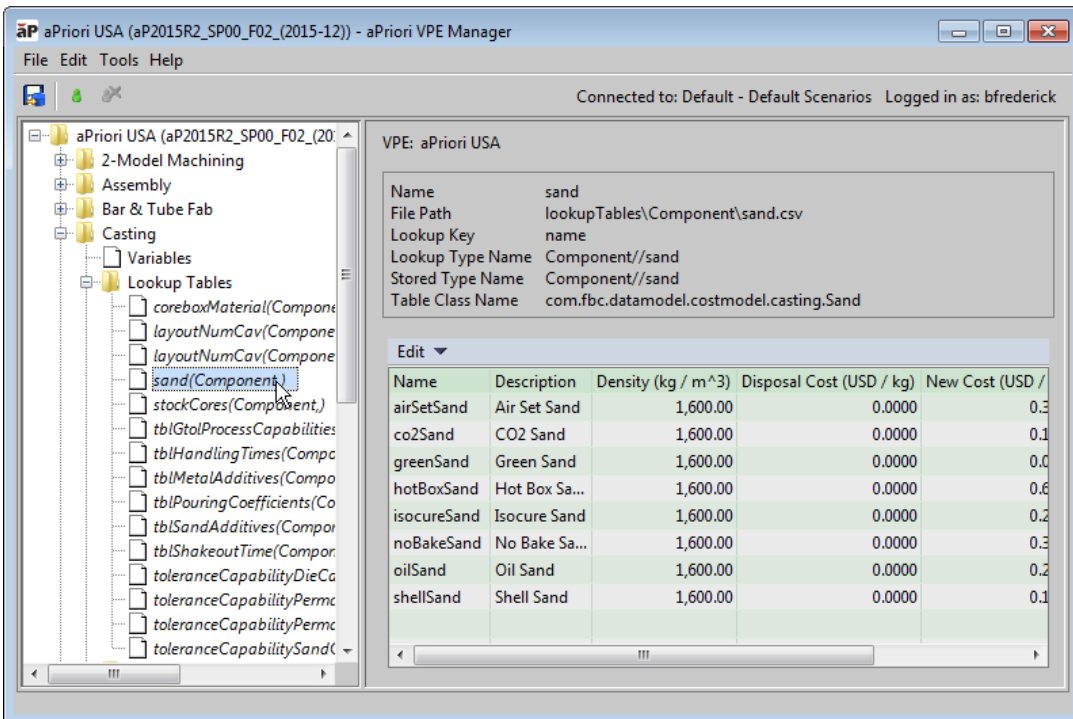
- 6 Select **Tools > VPE Toolset** from the aPriori menu bar to display the **aPriori VPE Toolset** window.



- 7 Click **VPE Manager** to display the **Select VPE** window.



- 8 Select a VPE and click **Open** to display the VPE in the **aPriori VPE Manager** window. Use the left pane to navigate through the process groups display their elements in the right pane.



## Managing VPEs

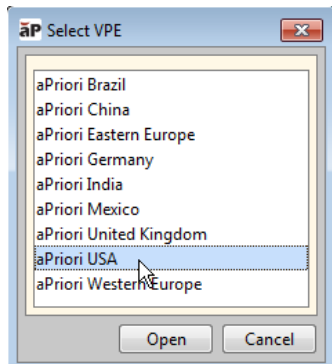
The **VPE Manager** allows you to view, create, copy, import, export, and delete VPEs, or portions of VPEs. The features described below can be found on different **VPE Toolset File** menus depending on context, but all are available from the **VPE Manager File** menu . You must purchase a separate license to create and copy VPEs.

## Opening a VPE

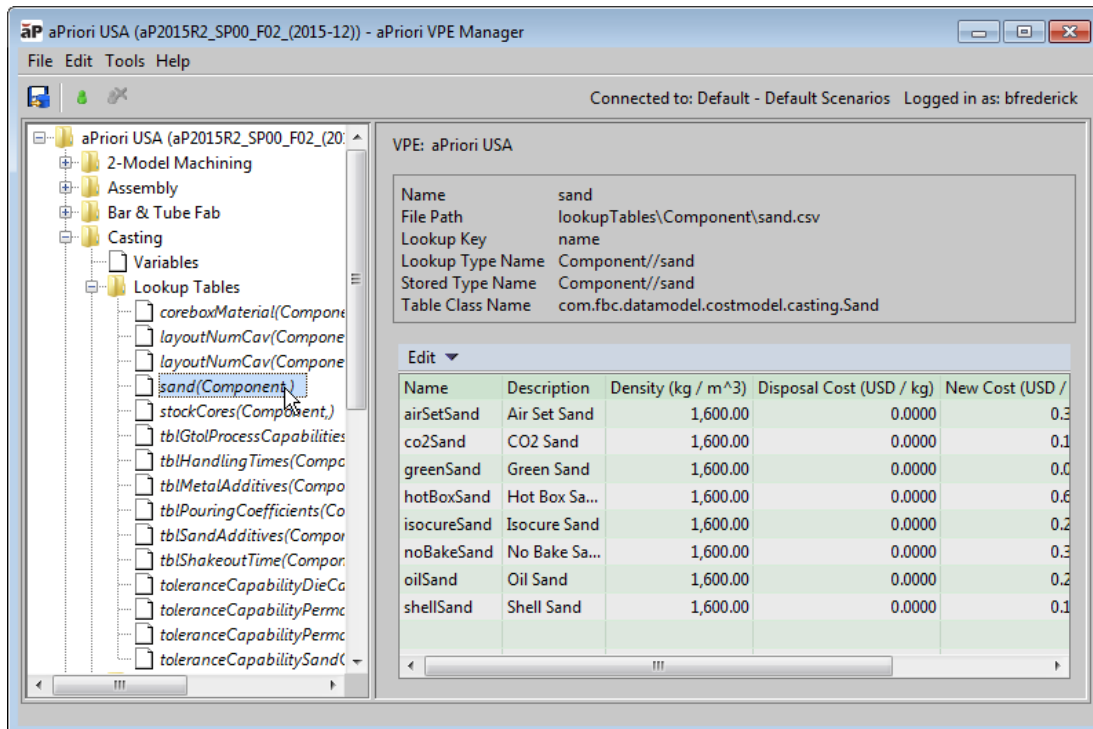
You can open a VPE from the **File** menu on the **VPE Toolset** or the **VPE Manager**. You can have multiple VPEs open at the same time.

### To open a VPE

- 1 To display the **Select VPE** window, either Select **File > Open VPE** from any **VPE Toolset** or **VPE Manager** tool bar, or just start the **VPE Manager**, which automatically prompts you to select a VPE:



- 2 Select the VPE you want to edit and click **Open** to display that VPE in the aPriori VPE Manager.





## Changing a VPE currency and exchange rate version

You can specify a default currency and a saved exchange rate version for this VPE.

- 1 Open the VPE as described in [Opening a VPE](#) above.
- 2 Click **Tools > VPEs > Change Currency**.
- 3 In the Change VPE Currency dialog, select the desired currency and (optionally) the desired saved exchange rate table from the drop-down menus.

For more information about saving exchange rate versions, see [Saving an exchange rate version](#).

## Creating a new VPE

The VPE Manager allows you to create a new VPE by copying an existing VPE, or by creating a new VPE from scratch and then adding process groups manually, or by creating an overlay VPE...

**Note:** aPriori strongly recommends that you create overlays when you need to create a new VPE. Since overlay VPEs can inherit values from their parents, they are much easier to maintain. This approach is also much preferable with recent developments in aPriori Cost Models and the introduction of Regional Data Libraries. The older methods of creating standalone VPEs from scratch or copying them from existing VPEs are covered below, but the preferred method of creating overlay VPEs is covered in detail in the following section: *Working with Overlay (“Inherited”) VPEs*.

**Note:** When creating VPEs, do NOT use hyphens, slashes, or ampersands (-, /, &) in the file names.

### To create a new VPE

- 1 If the **VPE Toolset** is not already open, click **Tools > VPE Toolset**.
- 2 Select **File > New VPE** from the VPE Manager menu bar to display the **New VPE** window.
- 3 Enter a unique name for the new VPE and click **OK** to create the VPE and open it the aPriori VPE Manager.
- 4 Optionally click the top entry in the navigation pane (the new VPE name) and scroll to the bottom of the screen. Enter a unique type name for this VPE. Although optional, this may be useful for creating Access Control statements to determine who has or does not have access to this VPE. For example, you may want to ensure that only European users have access to this new VPE. By creating a type called “VPE\_EU\_ONLY”, a System Administrator could use the Permissions tab to create a rule that prohibits North American users from accessing this VPE. (The default VPE Type for basic aPriori-provided VPEs is “Regional Data Libraries”.)

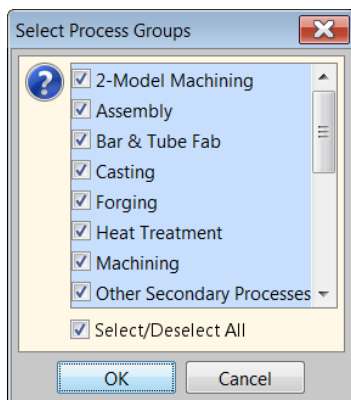
- 5 Optionally edit any of the other fields on this page to reflect the requirements of this new VPE.
- 6 Right-click the VPE, select **Add ProcessGroup** from the context menu, and select the process group you want to add to display the **Select baseline version** window.
- 7 Select the version of the cost model to use for the process group and click **OK** to add the process group to the VPE.

We recommend that you select the most recent version (that is, the one with the highest number), unless you know that you want to use an older version.

- 8 Repeat steps 4 and 5 for each process group you want to add.
- 9 When done, click the Publish icon (🌐) to save your changes.

### To make a standalone copy of a VPE

- 1 If the **VPE Toolset** is not already open, click **Tools > VPE Toolset**.
- 2 Select **File > Copy VPE > Disassociate from Source VPE (copy-only)...**
- 3 From the **Select VPE** window, select the VPE to copy and click **Copy**.
- 4 Enter a unique name for the new VPE and click **OK**.
- 5 In the **Select Process Groups** window, select each process group you want to include (or use the **Select/Deselect All** checkbox) and click **OK**.



- 6 When done, click the Publish icon (🌐) to save your changes.

### Working with Overlay (“Inherited”) VPEs

An *overlay* VPE (also referred to as an *inherited* VPE) is created from one or more VPEs and maintains a link to the original(s) so that updates to the parent(s) get passed on to the child.

You can make customizations to the overlay VPE, and these customizations get re-applied after the overlay is updated from a parent VPE. Individual data points in all VPE tables can be overridden, along with individual files in the cost model.

An overlay VPE can inherit values from up to four different parent VPEs, one each for the following:

- Cost Model information
- Material Catalog
- Machines
- Tool Shops

**Note:** Plant Variables in an overlay VPE are inherited from the Machine VPE. In previous releases, these values were inherited from Cost Model VPE.

When you save an overlay VPE, only the customizations are stored. When you open an overlay VPE, aPriori first loads the data from the parent VPE(s), and then applies all the local customizations.

You can create an overlay VPE from a starting point VPE, a custom VPE, or from another overlay VPE.

**Note:** Implementing overlay VPEs in a logical fashion requires some advance planning and set-up. For example, if you are just beginning to set up your overlay VPEs, it does not make much sense to assign different starting point VPEs to the different areas of your overlay VPE (such as aPriori USA to the Cost Model VPE field, aPriori Mexico to the Material Catalog field, and aPriori China to the Machines field, etc.) Rather, you might create a master overlay VPE for your company from one of the starting points, and customize it with company-specific overrides, and then create regional overlay VPEs from that master with their own customizations for machines and materials, and so on down to finer levels of resolution.

### Why use overlay VPEs?

aPriori starting point VPEs provide a starting point for you to set up your production VPEs. You are likely to create one or more custom VPEs to adjust or add some data and logic that reflect your manufacturing practices and buying power. You need to maintain your configurations and customizations, but you also want to continue to update data and logic from aPriori's semi-annual starting point updates.

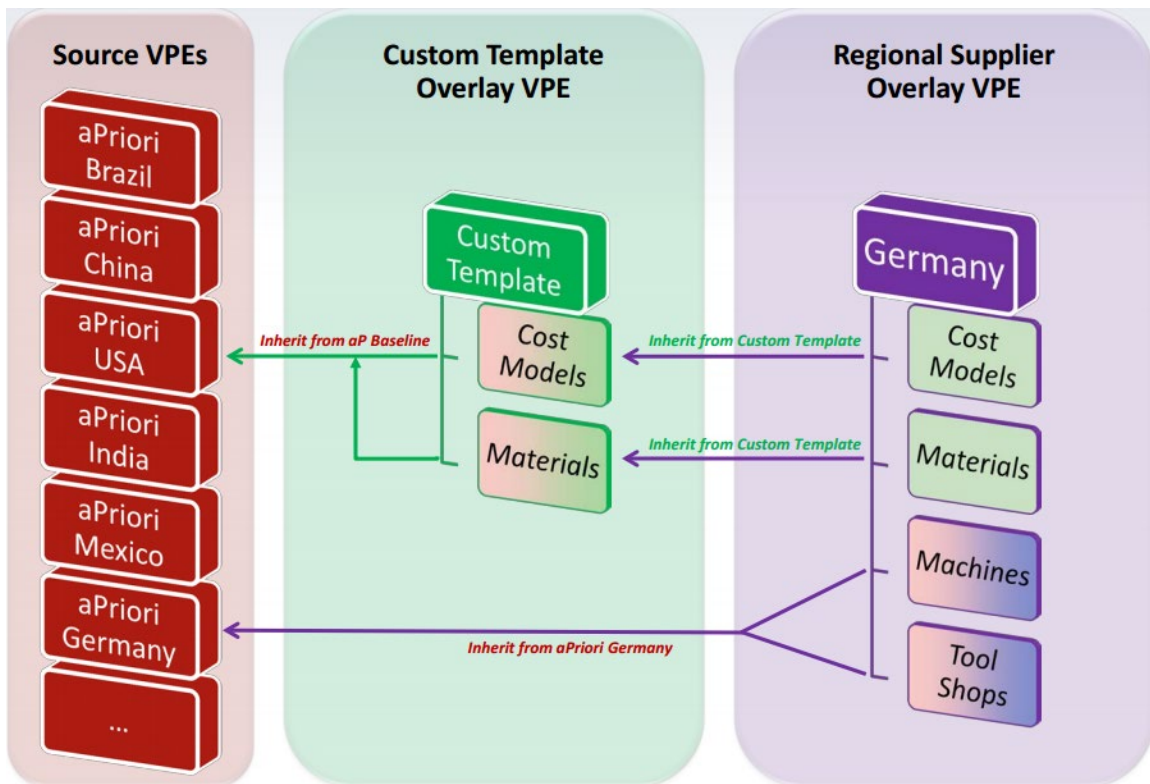
Overlay VPEs can be useful in this environment because they inherit from their parents, and then re-apply customizations. This means that VPEs that are derived from an aPriori starting point VPE automatically inherit semi-annual starting point updates, without overwriting your customizations. When you use overlay VPEs, you minimize the number of places you need to update data and logic.

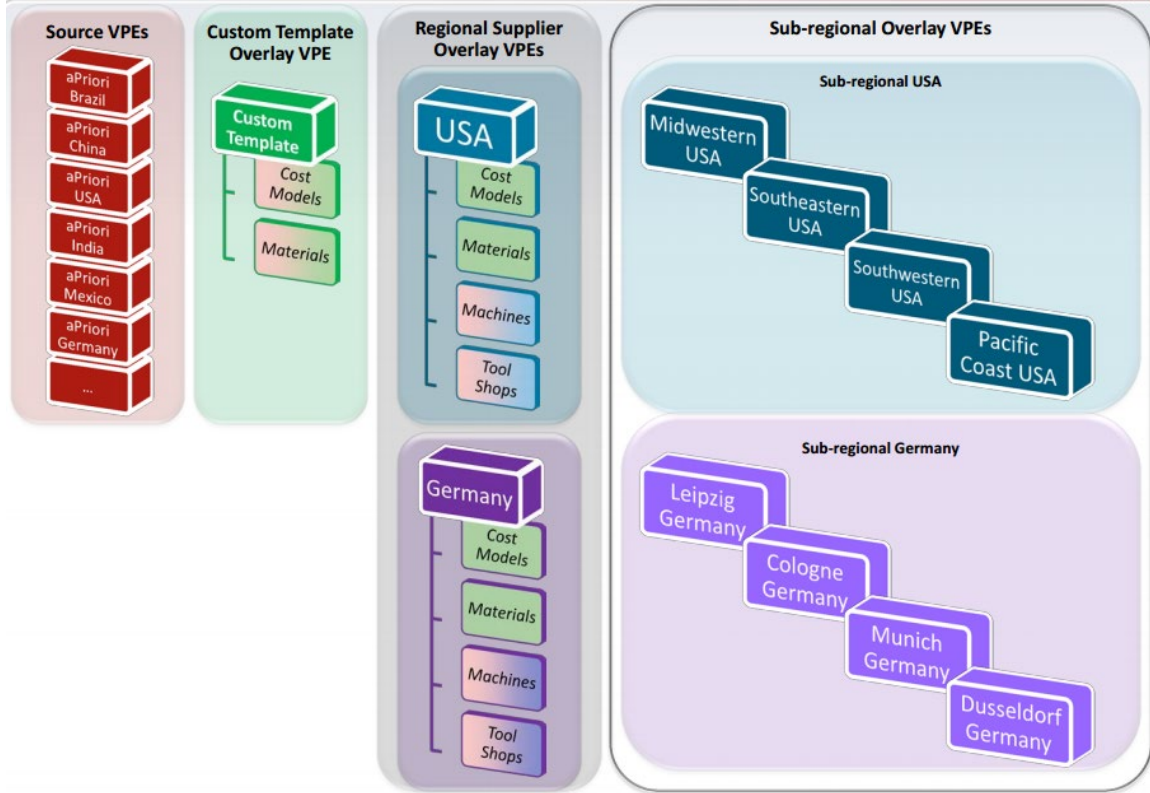
Here are some examples of how you might use overlay VPEs:

- Use an overlay VPE to create a customized cost model based on aPriori starting point data, allowing you to keep it updated with semi-annual starting point VPE updates.

- Create a master custom cost model, but then create regional overlay VPEs from it which inherit the majority of the model but which include small regional customizations (for example, the overlay VPEs all share the same underlying cost model for common processes, but each have their own routing structures).
- Same as above, except that the only difference between the child VPEs and the parent are the machine data, material rates, and logistics logic.
- Create a European overlay VPE in Euros that is based on the USA starting point VPE in US dollars.
- Create a European overlay VPE in Euros that is based on a custom European VPE in Euros.

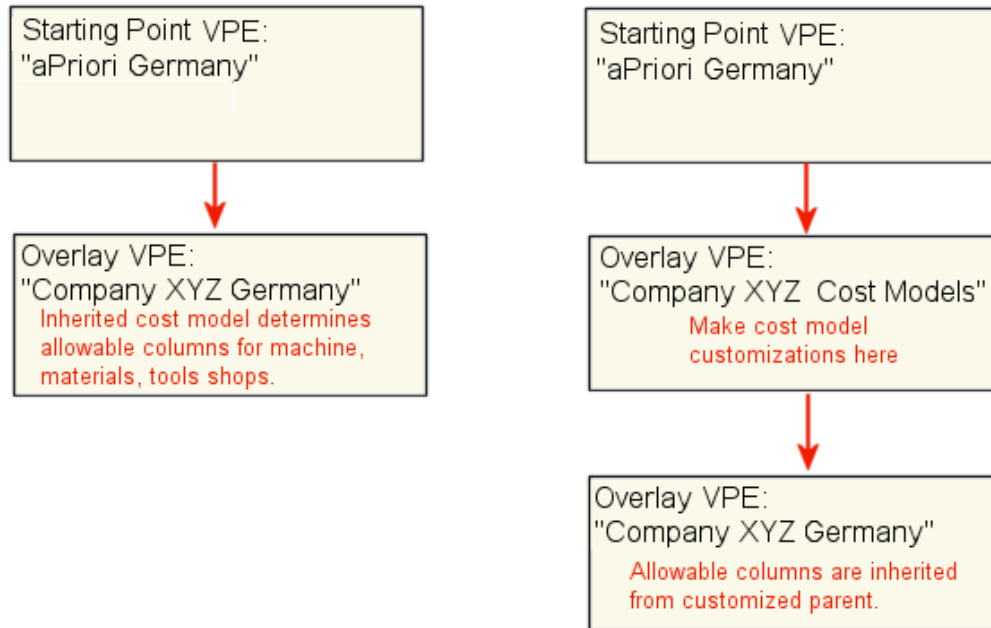
The following illustrations provide additional visual examples of overlay VPE usage.





**Note:** Updates to a parent VPE are guaranteed to be propagated to child VPEs only after a restart of aPriori.

It is important to realize that the cost model defines metadata such as columns and column types for machine, material, and tool shop tables. Therefore, if overlay VPE "Company\_XYZ\_Germany" inherits its cost model from starting point VPE "aPriori Germany", the only allowable columns for "Company\_XYZ\_Germany" machines and materials are those defined in the cost model versions for the various process groups in "aPriori Germany".

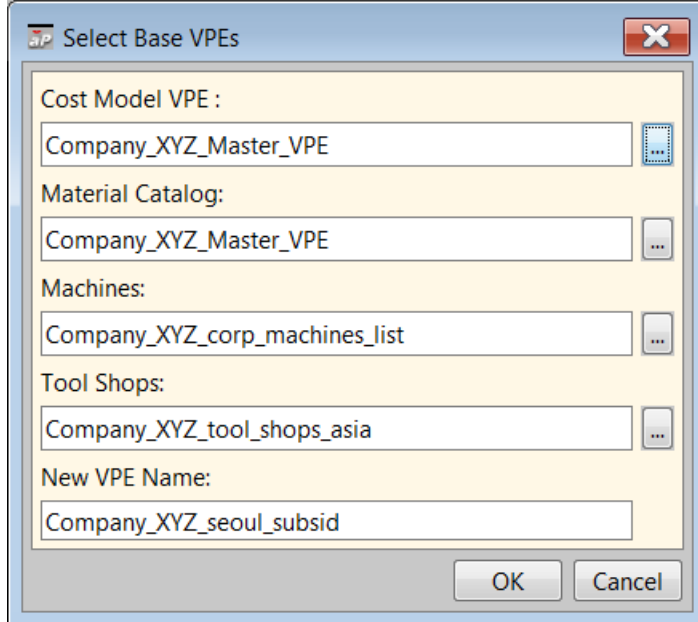



If you wanted “Company\_XYZ\_Germany” to have different columns for machines, materials or tool shops, you would want to create another overlay which inherits from “apriori Germany” and modify the metadata there. You could then have “Company\_XYZ\_Germany” use that VPE for its cost model base.

**Note:** Currently, when you override a material or a machine, there is no direct way to determine if a value is inherited or overridden.

### To create an overlay VPE

- 1 If the **VPE Toolset** is not already open, click **Tools > VPE Toolset**.
- 2 Select **File > Copy VPE > Maintain inheritance with Source VPE (copy and link)...**  
This displays the Select Base VPEs dialog.
- 3 Select the VPEs that you want to use as parents for this overlay VPE. Note that if you populate the **Cost Model VPE:** field, any of the other three VPE fields that are empty will be auto populated by this selection.  
  
In the screenshot below, a number of custom VPEs (probably overlays themselves) have already been created for the company, and these custom VPEs are used as parent for this new overlay VPE.



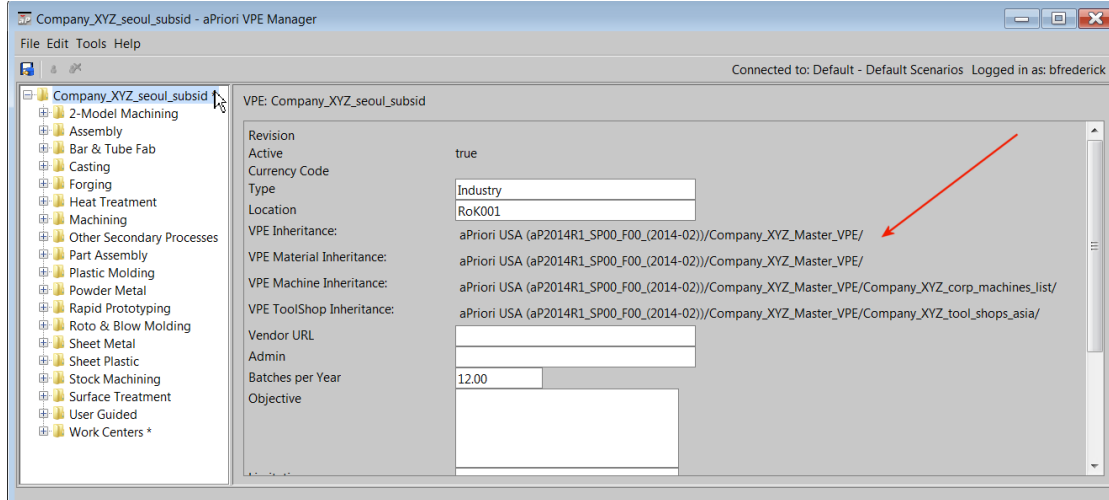
- 4 Enter a descriptive name for the new overlay VPE in the **New VPE Name:** field.
- 5 Click **OK**.
- 6 When done, click the Publish icon () to save your changes.

### To determine if a VPE is an overlay

Unless you use a special naming convention, it may not be immediately obvious whether or not a VPE is an overlay. Use this procedure to check, and to identify what VPEs it inherits from.

- 1 If the VPE is not already open, click **File > Open VPE** from the **aPriori VPE Toolset** and then select the VPE from the **Select VPE** window. Click **Open**.
- 2 In the resulting **aPriori VPE Manager** window, click the top-level entry in the left pane, and then examine the entries in the right pane.





If the VPE is an overlay, you will see an inheritance path for the following lines:

- **VPE Inheritance**
- **VPE Material Inheritance**
- **VPE Machine Inheritance**
- **VPE Tool Shop Inheritance**

**Notes:**

1. Regional Data Libraries (RDLs) will display “\*\*Unavailable\*\*” in the VPE Inheritance fields.
2. Standalone VPEs will display “N/A” in the VPE Inheritance fields.

**To use the Update to Latest buttons**

The inheritance lines in the display for an overlay VPE will be appended with **Update to Latest** buttons in the following circumstances:

- If you or another admin have loaded a newer Regional Data Library or have installed a baseline update for your VPEs.
- If you export this overlay VPE and import it into a newer environment.

**Update to Latest** for Material, Machine, and Toolshop inheritance tells aPriori to use the latest VPE Data available in the database for the given VPE.

**Update to Latest** for “VPE Inheritance” applies to the CSL/Base VPE and tells aPriori to use the Cost Model Versions (CMVs) *that are shipping with the latest RDL*. It does NOT change the actual CMV being used. For example, if in 16,2, you were using CMV 5 and in 17.1 aPriori provides CMV 10, **Update to Latest** will still result in CMV 5 being used, but now from the 17.1 version.

**Update to Latest** intentionally does not move you to the latest CMV on the latest RDL because aPriori wants this to be an explicit action on your part, since it is not known what additional migration upgrade work might be required. If your site has performed customizations, simply bumping the CMV could result in a VPE that doesn’t work correctly. This mechanism does allow you to implement bug fixes for older CMVs.



### To push plant variables to descendants

You can propagate updates to top level VPE plant variables to all overlay VPEs that inherit machine data from a specific VPE. This is useful for VPE managers who utilize Overlay VPEs within their deployment. For example, if your tool crib labor rate has increased, and your deployment has many VPEs which inherit their machine data from a single “template” VPE, that update can be made in the “template” VPE and this feature can be used to push the updated value down to all of the VPEs that inherit machine data from the “template” VPE..

- 1 From the VPE Toolset toolbar, click **Tools > Push Plant Variables to Dependents**
- 2 From the pull-down menu, select the parent VPE from which you wish to push plant variables.
- 3 Click **OK**.

### To rename or rebase overlay VPEs

Renaming or rebasing (i.e., changing which VPEs an overlay inherits from) overlay VPEs can be done with out-of-the-box aPriori Professional, but the procedure is manual, complex, and subject to errors due to typos.

If you need to rename or rebase your overlay VPEs, please contact aPriori Customer Support and request the optional “Overlay VPE Rename Script”.

## VPE Export operations

The VPE Manager provides the ability to export an entire VPE, or just certain portions such as processes, site variables, lookup tables, materials, machine data, etc.

Export a complete VPE when you want to:

- Perform periodic data maintenance or updates in your staging environment, and then copy the updated VPE back to your production environment.
- Copy a VPE to another server.
- Provide a copy of the VPE to aPriori Customer Support regarding an issue.
- Make a backup of the VPE before making changes to it.

You can export VPEs either one at a time, or several all at once.

Export just certain portions of a VPE (such as processes, lookup tables, data, etc.) for development or maintenance of a VPE. For example, you might develop or modify a process in one VPE (or in one process group) that would be useful in another VPE (or within the same VPE but in a different process group). Or you might regularly export, update, and re-import some of your data on a quarterly, semi-annual, or annual basis.

aPriori also provides additional options for editing smaller amounts of VPE data. See *Editing VPE data* for more information.

## To export a single VPE

- 1 From the **VPE Toolset** window or the **VPE Manager** window, click **File > Export > Export VPE to Zip**.

**Note:** The **Export to Excel** option is deprecated as of aPriori Release 2014R1. Use **Export to Zip** for all VPE exports.

If you are in the **VPE Manager** window, you will only be able to export the currently open VPE. (For more information, see *Opening a VPE* on page 9.)

If you are in the **VPE Toolset** window, you will be presented with a list of VPEs. Select the one you wish to export.

**Note:** When you export an overlay VPE to a compressed file, you are given the option of exporting just the overlay VPE itself, or the entire “*bundle*” -- the overlay VPE plus all the VPEs from which it inherits. In general, you should always select the entire bundle.

- 2 Navigate to the folder where you want to save the exported VPE file, enter a name for the file, and click **Save** to display the **VPE Change Log Entry** window.

Although you are specifying a name for the exported file, the name of the VPE contained in the exported files does not change. When imported, any existing VPE with the same VPE name will be overwritten. If you want to maintain a backup of the original VPE, make sure to export it prior to importing. For more information, see *Creating a new VPE* on page 10.

- 3 Enter a description of the changes made to the exported VPE and click **OK**.

For example, if you are exporting a staging environment VPE to import it into a production environment, enter the changes made from the previous production version to make users aware of your updates.

You can also click **Skip Log** to export the VPE without describing the changes.

A single `.vpe.zip` file is created.

## To export multiple VPEs

This is particularly useful when creating local backups of configuration work done in aPriori.

- 1 From the **VPE Toolset** window or the **VPE Manager** window, click **File > Export > Multiple VPEs**
- 2 Follow the prompts and the usage notes in the resulting **Export Multiple VPEs** window to:
  - Specify a folder to which the export files will be written.
  - Select the VPEs to export (**CTRL-click** or **SHIFT-click** to expand your selection(s)).

- Specify how to handle overlay VPEs: just the overlay VPE itself, or the entire “bundle” -- the overlay VPE plus all the VPEs from which it inherits. In general, you should always select the entire bundle.
- Specify a prefix for the file names.

**3** Click **OK**.

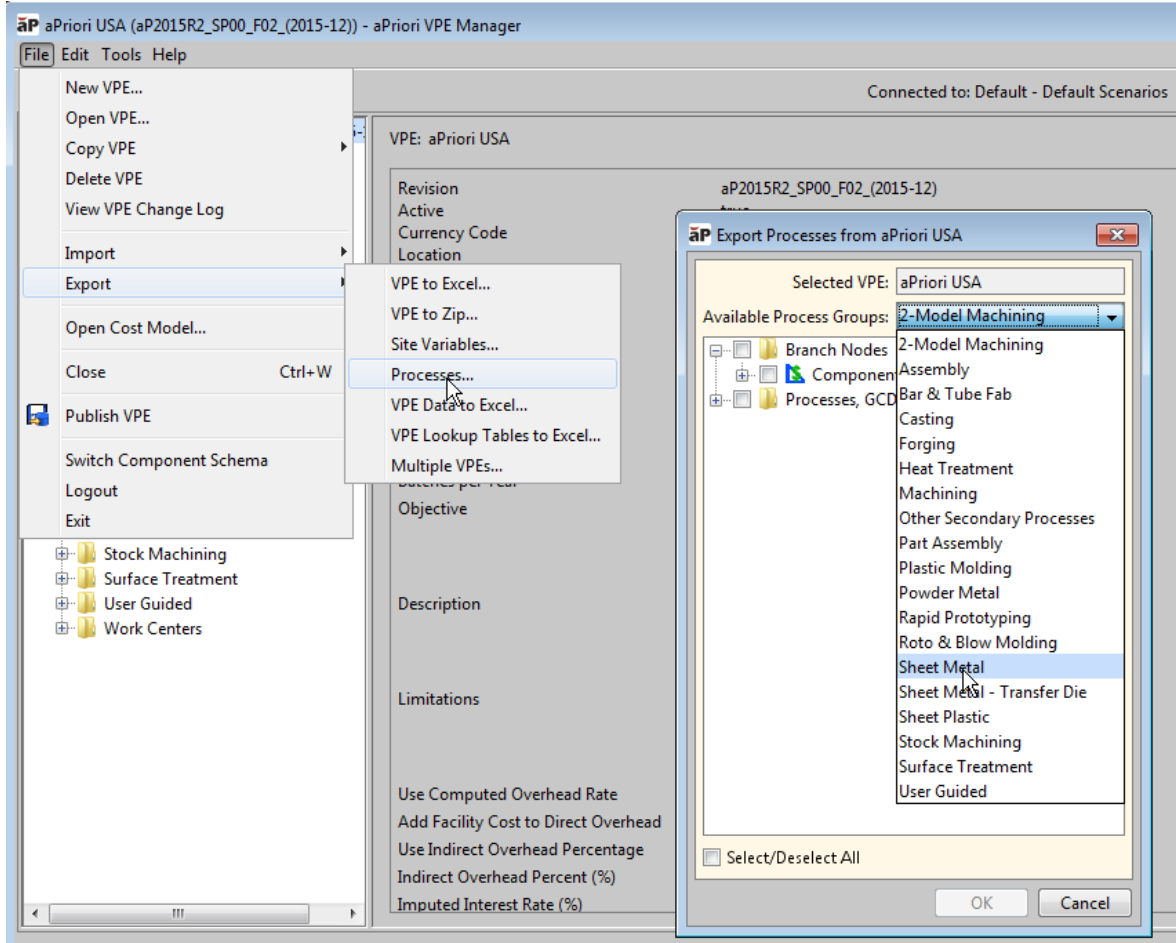
**4** To export site variables

See *To export site variables from a deployment* on page 97.

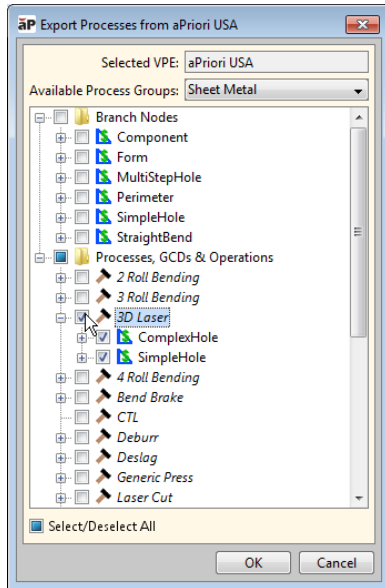
### **To export processes**

See *Exporting, modifying, and importing processes* on page 59 for information about when and how to use aPriori's process import/export capabilities.

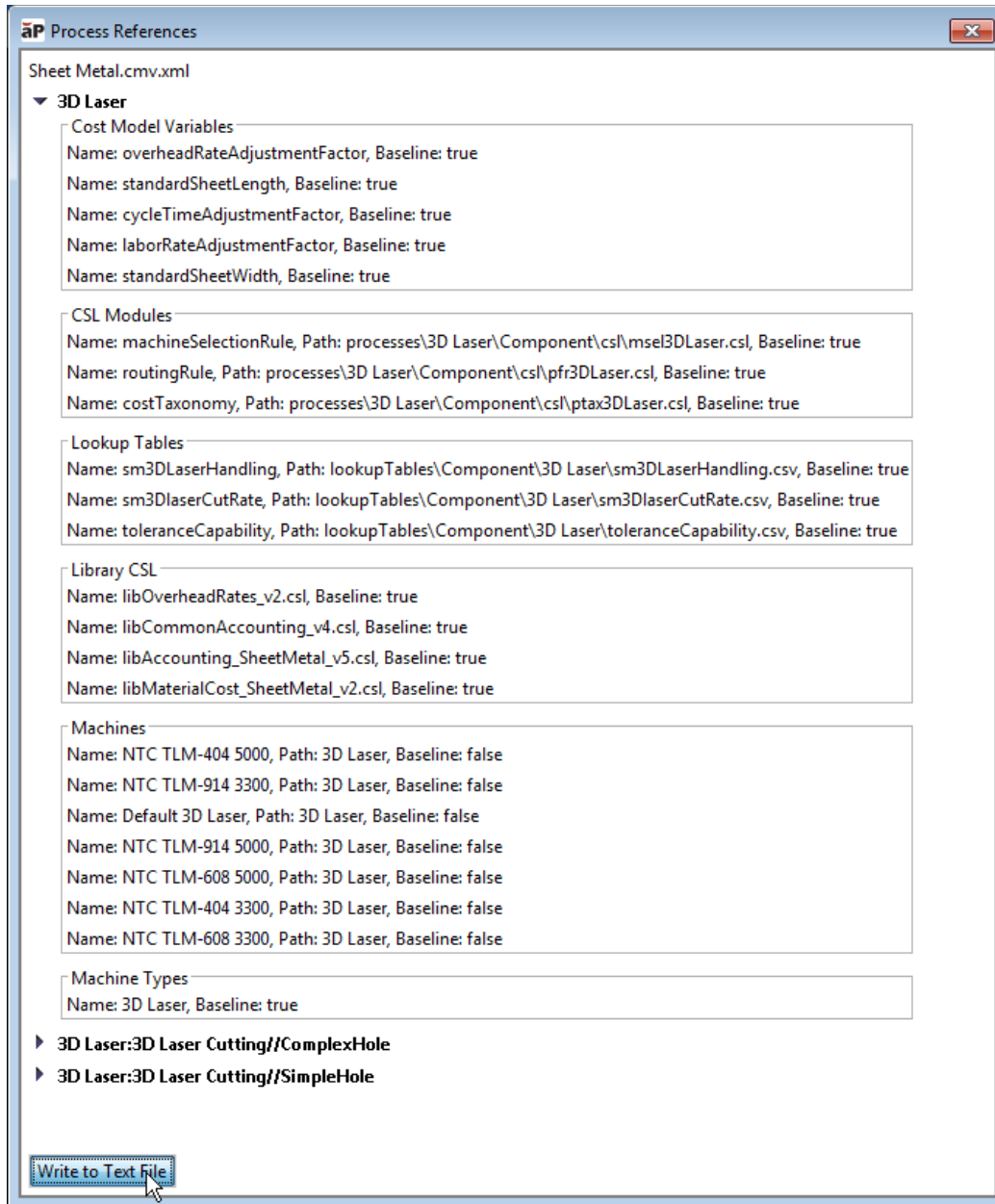
- 1** Open the VPE from which you want to export the process(es). In this example we will export from the aPriori USA VPE.
- 2** Click **File > Export > Processes...** from the **VPE Manager** tool bar.
- 3** In the **Export Processes** dialog, select the process group from which you want to export the process(es). In this example we will be exporting from the Sheet Metal process group.



- 4 Once you have selected the process group, expand and select the process-related elements that you want to export. In this example we just want to select the "3D Laser" so that we can copy it into a different process group. Then click **OK**.



- 5 When prompted, navigate to a folder and save the .zip file. Give it a more descriptive name if desired but be sure to leave the ".process.zip" extension intact.
- 6 Once the .zip file is saved, aPriori prompts you to also save a .txt file with a summary of the exported process info.



aPriori saves this in the same folder as (and with the same name as) the .zip file.

Name	Date modified	Type	Size
Sheet Metal_USA_3D_Laser.process.zip	2/17/2016 3:58 PM	Compressed (zipped) Folder	5 KB
Sheet Metal_USA_3D_Laser.process.zip.references.txt	2/17/2016 3:56 PM	Text Document	3 KB

## To export VPE Data to Excel

The VPE Toolset provides the ability to export VPE data such as machines, materials, tool shops, and plant variables to Excel spreadsheets. You can optionally edit the exported data in these Excel spreadsheets, and then import the data into either the original VPE or a different VPE where the imported data will be visible and used in subsequent costings in that VPE. This provides an efficient way to export/import just data of interest without including all the other elements of the VPE.

**Note:** If you have updated to 16.1 from an earlier release, make sure to read the "IMPORTANT NOTE ABOUT PRE-16.1 VPES" in the section "*To Import VPE Data from Excel*".

To add materials or machines, add a new row in the spreadsheet and populate it with the necessary details.

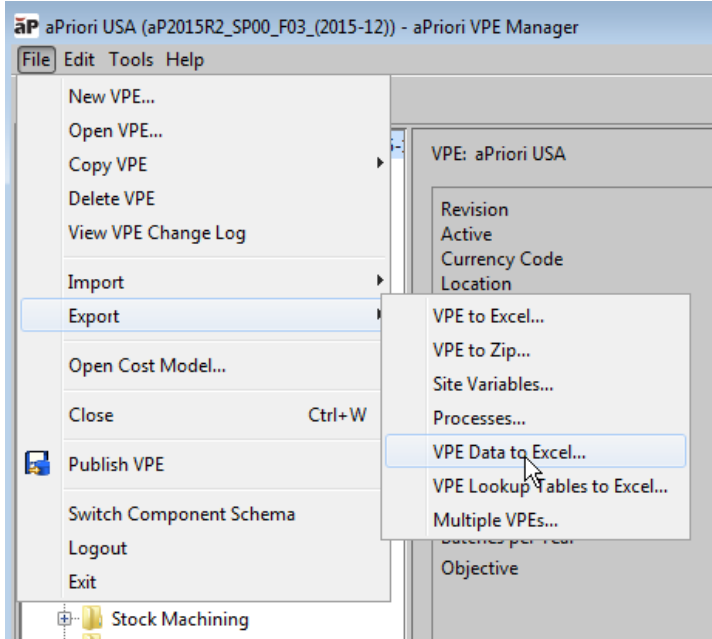
To remove a machine or a material, change the value in the Edit Operation column to "delete" by selecting from the dropdown menu.

**Note:** The Name column cannot be changed. Any changes to that column will be interpreted as a new material, machine, etc.

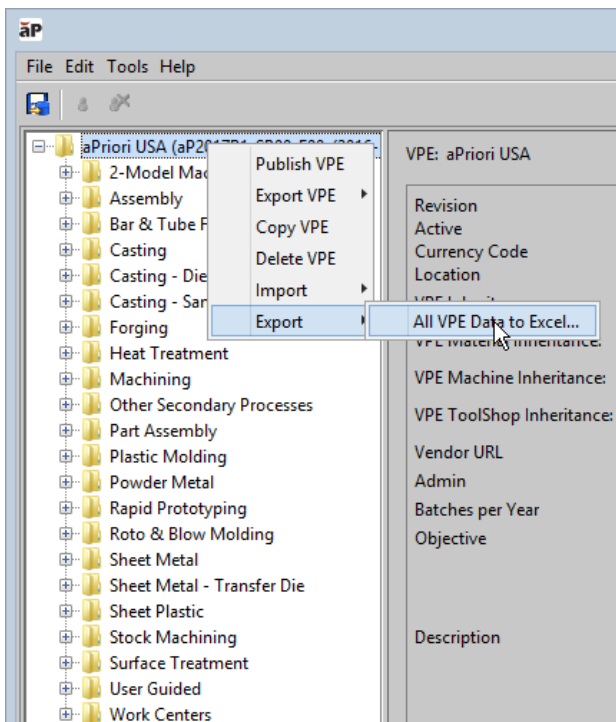
You should refer to the VPE Manager display whenever you change the values of fixed value fields (such as Cut Code) to ensure that the value you enter in Excel corresponds to an acceptable value in the VPE Manager.

The export process creates an index spreadsheet for the VPE, and separate spreadsheets for each of the process groups within the VPE. The index spreadsheet contains a cross-reference to all of the related process group spreadsheets and a sheet named "VPE\_data" containing all of the plant information for the VPE.

- 1 Open the VPE in the aPriori VPE Manager window, then click **File > Export > VPE Data to Excel**.



**Note:** Alternatively, you can open a specific VPE from within the **VPE Manager** and then right-click the top entry in the left-hand navigation pane, and select **Export > All VPE Data to Excel...** from the context menu:

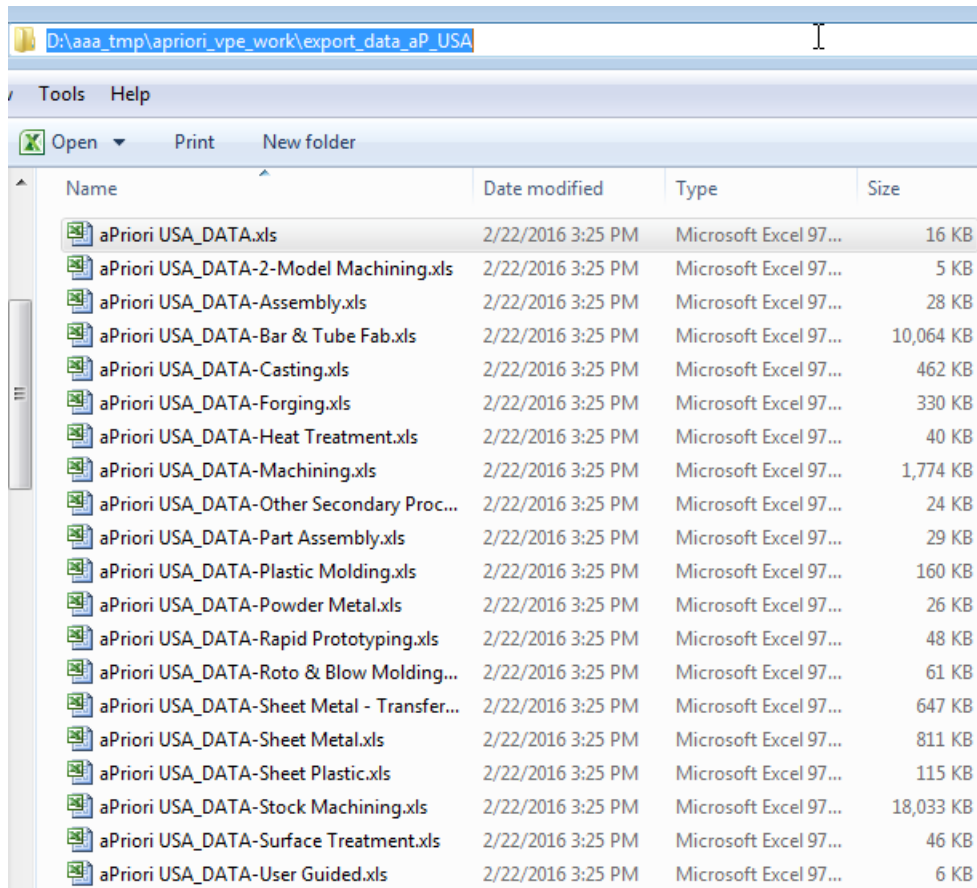


- 2 Navigate to the folder where you want to create the export Excel files. If you wish, modify the default name to something more specific. (The default name for the index spreadsheet is simply the VPE name. The spreadsheets for process groups have



the process group name appended to the default name. For example, "aPriori USA-Casting.xls"). Click **Okay**.

This creates an Excel file for every process group in the VPE, as well as an "index" spreadsheet:



The index spreadsheet (the only one that does not have a process group appended to its name) contains the top-level information about the VPE, as well as a cross-reference to all of the other process group-related spreadsheets created by the export. The "top-level" info is what you see in the **VPE Manager** when you click the VPE name at the top of the navigation page.

The screenshots below show how the info in the spreadsheets map to the displays in the VPE manager. Note that the **Import Behavior** column in the index spreadsheet simply flags those fields which cannot be edited and then re-imported. Also, the strings in the **Description** column are populated from the "tooltip" text when you hover over an item in the VPE Manager. These strings also cannot be edited and then re-imported.

### Index sheet mapping:

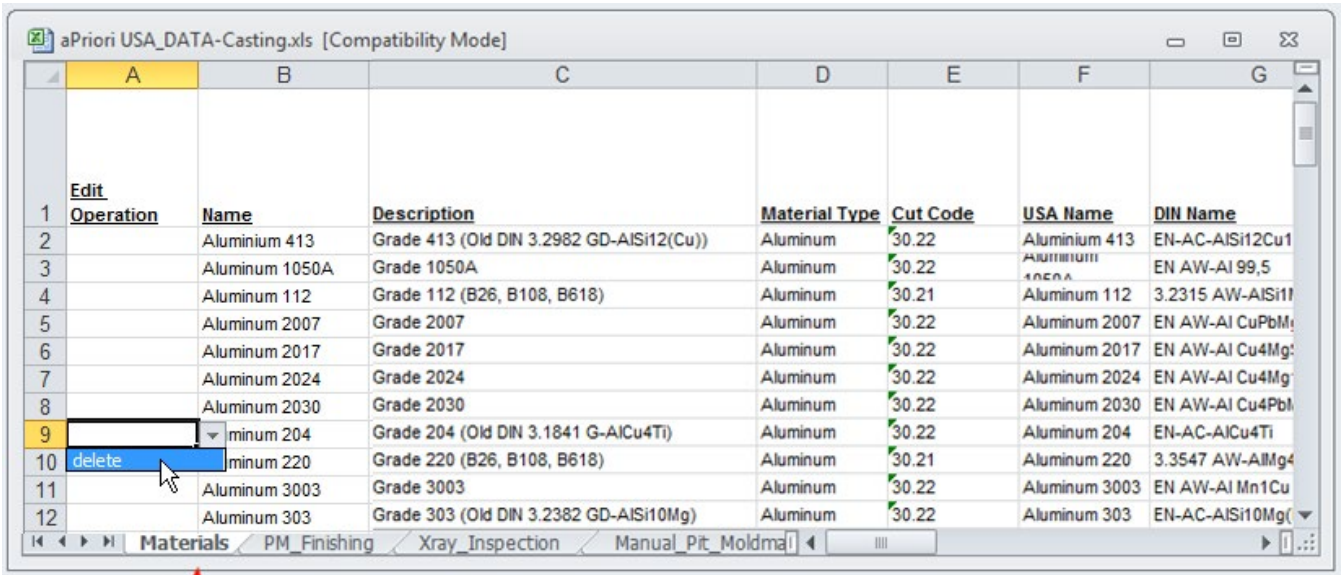
Display Name	Value	Import Behavior	Description
Revision	aP2015R2_SP00_F03_(2015-12)	For reference only. Changes to this field will not be imported into aPriori.	
Active	TRUE	For reference only. Changes to this field will not be imported into aPriori.	
Currency Code	USD	For reference only. Changes to this field will not be imported into aPriori.	
Location	United States		
VPE Inheritance:	N/A	For reference only. Changes to this field will not be imported into aPriori.	
VPE Material Inheritance:	N/A	For reference only. Changes to this field will not be imported into aPriori.	
VPE Machine Inheritance:	N/A	For reference only. Changes to this field will not be imported into aPriori.	
VPE ToolShop Inheritance:	N/A	For reference only. Changes to this field will not be imported into aPriori.	
Vendor URL	www.apriori.com		
Admin			
Batches per Year	12		
Objective			
Description	Data Release: 20151101 Subversion		
Limitations			
Use Computed Overhead Rate	TRUE		Set to true to compute overhead rates for machines and allow for override of final rate and all input values. Set to false to take overhead rates from machine table and allow for override of final rate only.
Add Facility Cost to Direct Overhead	FALSE		Set to true to include the facility cost in the direct overhead rate calculation. Set to false to leave facility costs in the
Use Indirect Overhead Percentage	FALSE		Set to true to use a simplified indirect overhead model where indirect overhead cost is modeled as a percent of the total variable cost instead of as an hourly rate
Indirect Overhead Percent (%)	0.2		Percentage of the production cost added to account for indirect overhead costs. This is used in place of indirect overhead rate
Imputed Interest Rate (%)	0.02541		Rate used to calculate the imputed interest on the machine
SG&A Percent (%)	0.09906		Rate for calculating Sales, General and Administrative expenses per part
Purchasing Power Factor	1		Purchasing Power Parity ratio of the region. (USA = 1.0)
Non Production Footprint Factor	0.3		Adjustment factor to workcenter footprint to account for non production factory space (i.e. hallways, offices, bathrooms)
Fire Insurance Factor (%)	0.001		Additional percentage of Annual Rent allocated to fire insurance

**aPriori USA (aP2015R2\_SP00\_F03\_(2015-12))**  
 VPE: aPriori USA  
 Revision: aP2015R2\_SP00\_F03\_(2015-12)  
 Active: true  
 Currency Code: USD  
 Location: United States  
 VPE Inheritance: N/A  
 VPE Material Inheritance: N/A  
 VPE Machine Inheritance: N/A  
 VPE ToolShop Inheritance: N/A  
 Vendor URL: www.apriori.com  
 Admin:  
 Batches per Year: 12.00  
 Objective:  
 Description: Data Release: 20151101  
 Subversion Revision: 74738-BRF  
 Limitations:  
 Use Computed Overhead Rate: true  
 Add Facility Cost to Direct Overhead: false  
 Use Indirect Overhead Percentage: false  
 Indirect Overhead Percent (%): 20.00  
 Imputed Interest Rate (%): 2.54  
 SG&A Percent (%): 9.91  
 Purchasing Power Factor: 1.00  
 Non Production Footprint Factor: 0.300  
 Fire Insurance Factor (%): 0.10  
 Loss Insurance Factor (%): 1.00

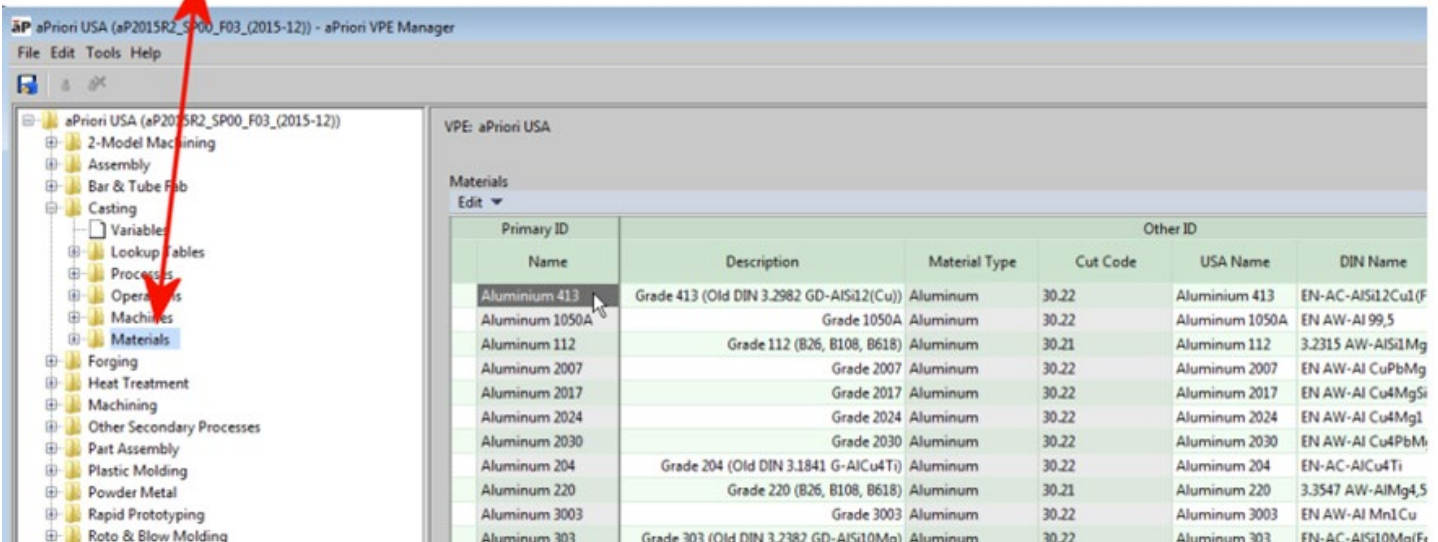
The spreadsheet for each process group contains sheets for materials, each machine, and (if applicable) tool shops. You can see the mapping between the VPE Manager display and the exported spreadsheet below, using the Casting process group as an example:

### Materials (process groups without material stock)

The first tab in the export spreadsheet maps to the **Materials** table in the **VPE Manager**. Most process groups simply consider the basic properties of the materials and each row lists a different material:



1	<u>Edit</u> <u>Operation</u>	<u>Name</u>	<u>Description</u>	<u>Material Type</u>	<u>Cut Code</u>	<u>USA Name</u>	<u>DIN Name</u>
2		Aluminum 413	Grade 413 (Old DIN 3.2982 GD-AISi12(Cu))	Aluminum	30.22	Aluminium 413	EN-AC-AISi12Cu1
3		Aluminum 1050A	Grade 1050A	Aluminum	30.22	Aluminium 1050A	EN AW-AI 99,5
4		Aluminum 112	Grade 112 (B26, B108, B618)	Aluminum	30.21	Aluminium 112	3.2315 AW-AISi11
5		Aluminum 2007	Grade 2007	Aluminum	30.22	Aluminium 2007	EN AW-AI CuPbMg
6		Aluminum 2017	Grade 2017	Aluminum	30.22	Aluminium 2017	EN AW-AI Cu4MgSi
7		Aluminum 2024	Grade 2024	Aluminum	30.22	Aluminium 2024	EN AW-AI Cu4Mg
8		Aluminum 2030	Grade 2030	Aluminum	30.22	Aluminium 2030	EN AW-AI Cu4PbMg
9		minum 204	Grade 204 (Old DIN 3.1841 G-AICu4Ti)	Aluminum	30.22	Aluminium 204	EN-AC-AICu4Ti
10	delete	minum 220	Grade 220 (B26, B108, B618)	Aluminum	30.21	Aluminium 220	3.3547 AW-AIMg4,5
11		Aluminum 3003	Grade 3003	Aluminum	30.22	Aluminium 3003	EN AW-AI Mn1Cu
12		Aluminum 303	Grade 303 (Old DIN 3.2382 GD-AISi10Mg)	Aluminum	30.22	Aluminium 303	EN-AC-AISi10Mg



Primary ID	Name	Description	Material Type	Cut Code	USA Name	DIN Name
	Aluminium 413	Grade 413 (Old DIN 3.2982 GD-AISi12(Cu))	Aluminum	30.22	Aluminium 413	EN-AC-AISi12Cu1(F
	Aluminum 1050A	Grade 1050A	Aluminum	30.22	Aluminium 1050A	EN AW-AI 99,5
	Aluminum 112	Grade 112 (B26, B108, B618)	Aluminum	30.21	Aluminium 112	3.2315 AW-AISi1Mg
	Aluminum 2007	Grade 2007	Aluminum	30.22	Aluminium 2007	EN AW-AI CuPbMg
	Aluminum 2017	Grade 2017	Aluminum	30.22	Aluminium 2017	EN AW-AI Cu4MgSi
	Aluminum 2024	Grade 2024	Aluminum	30.22	Aluminium 2024	EN AW-AI Cu4Mg1
	Aluminum 2030	Grade 2030	Aluminum	30.22	Aluminium 2030	EN AW-AI Cu4PbMg
	Aluminum 204	Grade 204 (Old DIN 3.1841 G-AICu4Ti)	Aluminum	30.22	Aluminium 204	EN-AC-AICu4Ti
	Aluminum 220	Grade 220 (B26, B108, B618)	Aluminum	30.21	Aluminium 220	3.3547 AW-AIMg4,5
	Aluminum 3003	Grade 3003	Aluminum	30.22	Aluminium 3003	EN AW-AI Mn1Cu
	Aluminum 303	Grade 303 (Old DIN 3.2382 GD-AISi10Mg)	Aluminum	30.22	Aluminium 303	EN-AC-AISi10Mg(F

## Materials (process groups WITH material stock):

A few process groups -- Forging, Bar & Tube, Sheet Metal, and Sheet Metal -- Transfer Die -- must use material in the form of pre-formed stock: round tubes, solid bars, I-beams, etc. Each of these can come in different lengths, made of different materials, and these factors must be taken into account during the costing of the part that uses them. For these process groups, the **Materials** tab is much larger and is populated with all the additional stock information found in the VPE Manager.

Operation	Name	Description
1	Aluminum, ANSI 6061	Grade 6061 (B209, B211, B221, B311, B424, B241, B308)

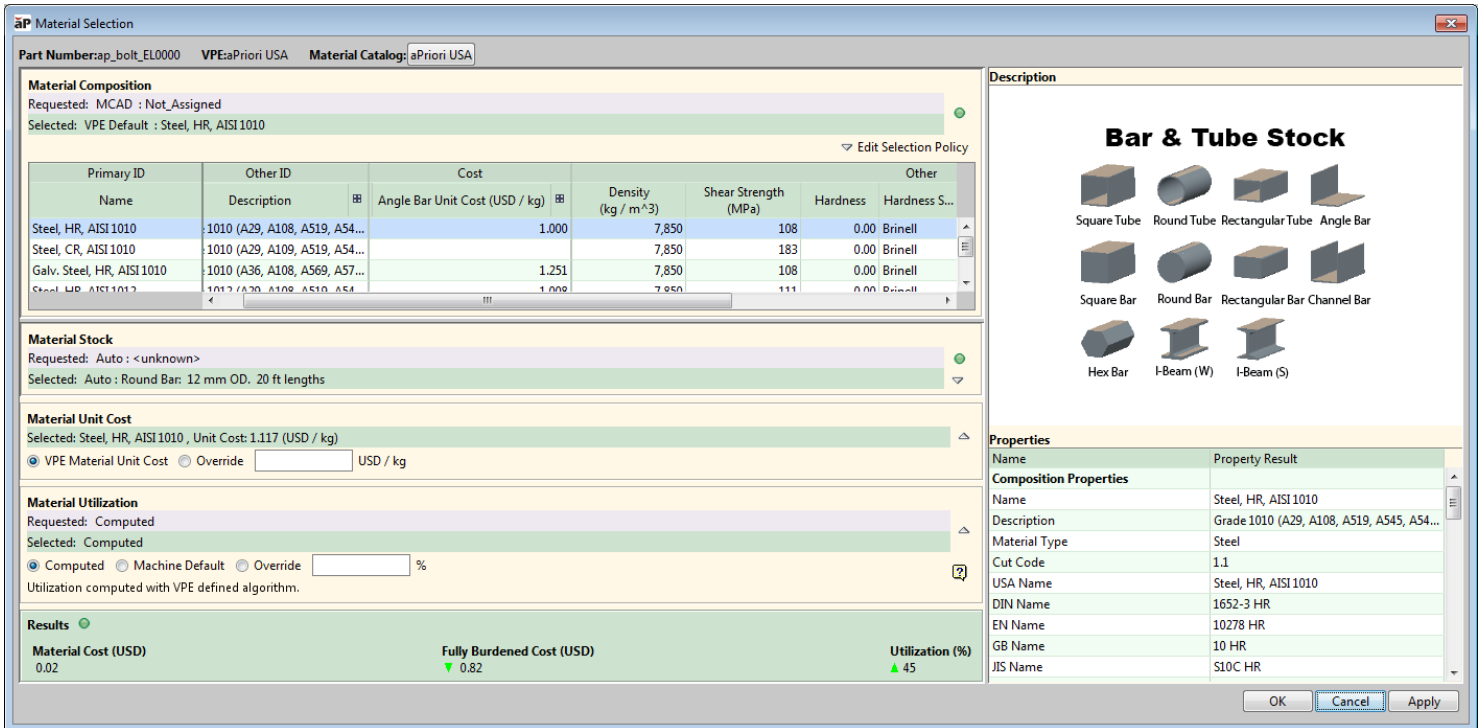
Material Stock: Form Name	Material Stock: Name
ANGLE_BAR	Angle: 1 1/2 w x 1 1/2 h x 1/4 t in. 20 ft len
ANGLE_BAR	Angle: 1 1/4 w x 1 1/4 h x 1/8 t in. 20 ft len
ANGLE_BAR	Angle: 1 3/4 w x 1 3/4 h x 1/4 t in. 20 ft len
ANGLE_BAR	Angle: 1 w x 1 h x 1/8 t in. 20 ft lengths
ANGLE_BAR	Angle: 1/2 w x 1/2 h x 1/8 t in. 20 ft lengths
ANGLE_BAR	Angle: 100 w x 100 h x 8 t mm. 20 ft lengths
ANGLE_BAR	Angle: 105 w x 105 h x 8 t mm. 20 ft lengths
ANGLE_BAR	Angle: 11/16 w x 11/16 h x 1/8 t in. 20 ft len
ANGLE_BAR	Angle: 110 w x 110 h x 8 t mm. 20 ft lengths
ANGLE_BAR	Angle: 120 w x 120 h x 8 t mm. 20 ft lengths
ANGLE BAR	Angle: 130 w x 130 h x 8 t mm. 20 ft lengths

Connected to: Default - Default Scenarios Logged in as: bfredrick

VPE: aPriori USA

Name	Aluminum, ANSI 6061
Description	Grade 6061 (B209, B211, B221, B311, B424, B241, B308)
Material Type	Aluminum
Cut Code	30.11
USA Name	Aluminum, ANSI 6061
DIN Name	3.3211
EN Name	485-2
GB Name	LD30
JIS Name	6061
Angle Bar Unit Cost (USD / kg)	4.262
Angle Bar Cost Units	Cost per KG
Angle Bar Cost Per Unit	4.26
Channel Bar Unit Cost (USD / kg)	5.616
Channel Bar Cost Units	Cost per KG
Channel Bar Cost Per Unit	5.62
Hex Bar Unit Cost (USD / kg)	4.337
Hex Bar Cost Units	Cost per KG
Hex Bar Cost Per Unit	4.34
I-Beam Unit Cost (USD / kg)	

When working with these stock-based process groups, it may also be helpful to refer to the **Material Selection** window in the main aPriori UI:



**Material Selection**

Part Number: ap\_bolt\_EL0000 VPE: aPriori USA Material Catalog: aPriori USA

**Material Composition**  
 Requested: MCAD : Not\_Assigned  
 Selected: VPE Default : Steel, HR, AISI 1010

Primary ID	Other ID	Cost	Density	Shear Strength	Hardness	Other
Name	Description	Angle Bar Unit Cost (USD / kg)	(kg / m <sup>3</sup> )	(MPa)		Hardness S...
Steel, HR, AISI 1010	1010 (A29, A108, A519, A54...	1.000	7,850	108	0.00	Brinell
Steel, CR, AISI 1010	1010 (A29, A109, A519, A54...		7,850	183	0.00	Brinell
Galv. Steel, HR, AISI 1010	1010 (A36, A108, A569, A57...	1.251	7,850	108	0.00	Brinell
Steel, HR, AISI 1010	1010 (A29, A108, A519, A54...	1.000	7,850	111	0.00	Brinell

**Material Stock**  
 Requested: Auto : <unknown>  
 Selected: Auto : Round Bar: 12 mm OD. 20 ft lengths

**Material Unit Cost**  
 Selected: Steel, HR, AISI 1010 , Unit Cost: 1.117 (USD / kg)  
 VPE Material Unit Cost  Override  USD / kg

**Material Utilization**  
 Requested: Computed  
 Selected: Computed  
 Computed  Machine Default  Override  %  
 Utilization computed with VPE defined algorithm.

**Results**

<b>Material Cost (USD)</b>	<b>Fully Burdened Cost (USD)</b>	<b>Utilization (%)</b>
0.02	▼ 0.82	▲ 45

**Description**

**Bar & Tube Stock**

Square Tube Round Tube Rectangular Tube Angle Bar

Square Bar Round Bar Rectangular Bar Channel Bar

Hex Bar I-Beam (W) I-Beam (S)

**Properties**

Name	Property Result
<b>Composition Properties</b>	
Name	Steel, HR, AISI 1010
Description	Grade 1010 (A29, A108, A519, A545, A54...
Material Type	Steel
Cut Code	1.1
USA Name	Steel, HR, AISI 1010
DIN Name	1652-3 HR
EN Name	10278 HR
GB Name	10 HR
JIS Name	S10C HR

OK Cancel Apply

## Machines:

The next several tabs contain the machine information.

aPriori USA\_DATA-Casting.xls [Group] [Compatibility Mode]

	A	B	C	D	E	F	G	H	I
	<u>Edit</u>	<u>Work Center</u>		<u>Labor Rate</u>	<u>Direct</u>	<u>Indirect</u>	<u>Overhead</u>	<u>Number of</u>	<u>Labor Time</u>
1	<u>Operation</u>	<u>Name</u>	<u>Name</u>	<u>(USD / hr)</u>	<u>Rate (USD /</u>	<u>Rate (USD /</u>	<u>Multiplier</u>	<u>Operators</u>	<u>Standard</u>
2		Default	Hand Grind	20.54	0.19434	7.31473	0	1	1
3		Default	Small Snag Wheel	20.54	0.1972	7.31473	0	1	1
4		Default	Snag Wheel	20.54	0.39441	7.31473	0	1	1
5		Default	Snag With Hoist	20.54	0.56601	7.31473	0	1	1
6									
7									
8									
9									
10									
11									
12									

Materials PM Finishing Xray\_Inspection Manual\_Pit\_Moldmak

aPriori USA (aP2015R2\_SP00\_F03\_(2015-12)) - aPriori VPE Manager

File Edit Tools Help

Connected to: Default - Default Scenarios Logged

VPE: aPriori USA

Edit

Primary ID	Other ID	Accounting						
Name	Workcenter	Labor Rate (USD / hr)	Direct Overhead Rate (USD / hr)	Indirect Overhead Rate (USD / hr)	Overhead Multiplier	Number of...	Labor Time Stand...	
Hand Grind	Default	20.54	0.19	7.31	0.00	1.00	1.00	
Small Snag Wheel	Default	20.54	0.20	7.31	0.00	1.00	1.00	
Snag Wheel	Default	20.54	0.39	7.31	0.00	1.00	1.00	
Snag With Hoist	Default	20.54	0.57	7.31	0.00	1.00	1.00	



## Tool Shops:

Any tool shops defined under the VPE processes will be allocated to the far-right tabs in the export spreadsheets, with a "\_tshops" extension.

**Note:** Only one tool shop is supported per process, so you cannot add additional tool shops via Excel.

The image displays two screenshots. The top screenshot is an Excel spreadsheet titled 'aPriori USA\_DATA-Casting.xls [Compatibility Mode]'. It shows a table with columns for tool shop details. The bottom screenshot is the 'aPriori VPE Manager' interface, showing a tree view of processes and tool shops. A red arrow points from the 'DefaultHorizontalAutomaticToolShop' entry in the tree to the corresponding tab in the Excel spreadsheet.

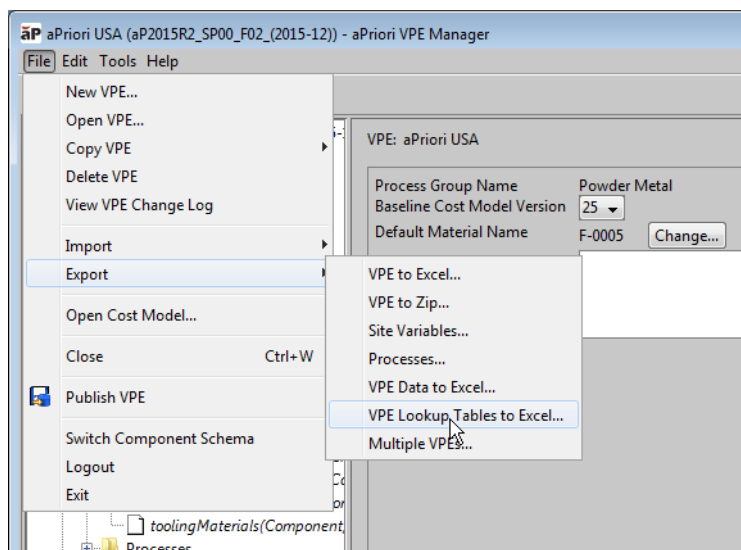
Operation Name	Default Tool Material Name	Description	Region Multiplier	Tool Material: Name	Tool Material: Cost Constant	Tool Material: Cost Pattern Volume	Tool Material: Cost Per Avg Thickness	Tool Material: Cost Per Flask Size	Tool Material: Cost Per Max Thickness	Tool Material: Cost Per Num Cavities	Tool Material: Cost Per Num Surfaces
DefaultHorizontalAutomaticToolShop	Cast Aluminum		1	Cast Aluminum	0	0	0	0	0	422.3	2.05
				Machined Iron	0	0	0	0	0	844.76	4.105
				Plastic	0	0	0	0	0	350.3	1.05
				Wood	0	0	0	0	0	289	1.4

## To export VPE Lookup Tables to Excel

VPE lookup tables provide tabular data, either for a cost model in general, or for a specific process or operation. (Lookup tables are described in detail in the section "Working with Lookup Tables" in the *Cost Model Workbench User Guide*.) The VPE Manager provides the ability to export all lookup tables in a VPE to an Excel spreadsheet where the information can be imported into a different VPE or modified and then re-imported into the original VPE.

For a practical example of how this can work, you can review aPriori's separately licensed Wire Harness VPE, which uses this functionality to load and maintain a "Component Library" lookup table of approved parts. See "Updating the Component Library" starting on page 139 for more information.

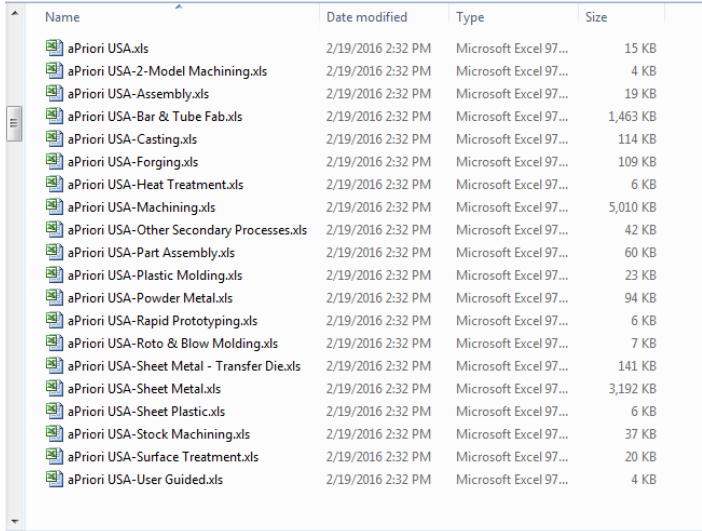
- 1 Open the VPE in the aPriori VPE Manager window, then click **File > Export > VPE Lookup tables to Excel**.



- 3 Navigate to the folder where you want to create the export Excel files. If you wish, modify the default name to something more specific. (The default name is simply the VPE name. such as "aPriori USA.xls). Click **Okay**.

This creates an Excel file for every process group in the VPE, as well as an "index" spreadsheet for all of the other sheets created by the export.





Name	Date modified	Type	Size
aPriori USA.xls	2/19/2016 2:32 PM	Microsoft Excel 97...	15 KB
aPriori USA-2-Model Machining.xls	2/19/2016 2:32 PM	Microsoft Excel 97...	4 KB
aPriori USA-Assembly.xls	2/19/2016 2:32 PM	Microsoft Excel 97...	19 KB
aPriori USA-Bar & Tube Fab.xls	2/19/2016 2:32 PM	Microsoft Excel 97...	1,463 KB
aPriori USA-Casting.xls	2/19/2016 2:32 PM	Microsoft Excel 97...	114 KB
aPriori USA-Forging.xls	2/19/2016 2:32 PM	Microsoft Excel 97...	109 KB
aPriori USA-Heat Treatment.xls	2/19/2016 2:32 PM	Microsoft Excel 97...	6 KB
aPriori USA-Machining.xls	2/19/2016 2:32 PM	Microsoft Excel 97...	5,010 KB
aPriori USA-Other Secondary Processes.xls	2/19/2016 2:32 PM	Microsoft Excel 97...	42 KB
aPriori USA-Part Assembly.xls	2/19/2016 2:32 PM	Microsoft Excel 97...	60 KB
aPriori USA-Plastic Molding.xls	2/19/2016 2:32 PM	Microsoft Excel 97...	23 KB
aPriori USA-Powder Metal.xls	2/19/2016 2:32 PM	Microsoft Excel 97...	94 KB
aPriori USA-Rapid Prototyping.xls	2/19/2016 2:32 PM	Microsoft Excel 97...	6 KB
aPriori USA-Roto & Blow Molding.xls	2/19/2016 2:32 PM	Microsoft Excel 97...	7 KB
aPriori USA-Sheet Metal - Transfer Die.xls	2/19/2016 2:32 PM	Microsoft Excel 97...	141 KB
aPriori USA-Sheet Metal.xls	2/19/2016 2:32 PM	Microsoft Excel 97...	3,192 KB
aPriori USA-Sheet Plastic.xls	2/19/2016 2:32 PM	Microsoft Excel 97...	6 KB
aPriori USA-Stock Machining.xls	2/19/2016 2:32 PM	Microsoft Excel 97...	37 KB
aPriori USA-Surface Treatment.xls	2/19/2016 2:32 PM	Microsoft Excel 97...	20 KB
aPriori USA-User Guided.xls	2/19/2016 2:32 PM	Microsoft Excel 97...	4 KB

You can now modify the Excel files with updated lookup table info and then re-import into the current VPE, or just import the exported Excel files into another VPE.

If you are modifying a sheet with data from a .csv file or another spreadsheet, it is critical that you ensure that the columns in the import file match the columns in the lookup table spreadsheet exactly.

Then you must copy the cells from the import spreadsheet and paste them into the corresponding cells in the Assembly componentLibrary sheet. If you are *replacing* all the information in your Component Library, make sure that no old data remains in the target spreadsheet after the **Paste**. If you are *adding* new information, make sure that you do not overwrite data that you wish to keep. Save the modified spreadsheet when done.

The screenshots below show how the data in the lookup table spreadsheets map to the displays in the VPE Manager. (The index spreadsheet is the same as described in the previous section for exporting VPE data.)

The spreadsheet for each process group has a tab for each lookup table in that process group:

aPriori USA\_LUTs-Casting.xls [Compatibility Mode]

	A	B	C	D	E	F
1	Name	Description	Density (kg / m <sup>3</sup> )	Disposal Cost (USD / kg)	New Cost (USD / kg)	Recycle Cost (USD / kg)
2	airSetSand	Air Set Sand	1600	0	0.33	0.0264
3	co2Sand	CO2 Sand	1600	0	0.1101	0
4	greenSand	Green Sand	1600	0	0.0165	0.0013
5	hotBoxSand	Hot Box Sand	1600	0	0.6608	0
6	isocureSand	Isocure Sand	1600	0	0.2203	0
7	noBakeSand	No Bake Sand	1600	0	0.33	0.0264
8	oilSand	Oil Sand	1600	0	0.2643	0
9	shellSand	Shell Sand	1600	0	0.1762	0
10						
11						
12						
13						
14						

coreboxMaterial layoutNumCav sand

aPriori USA (aP2015R2\_SP00\_F02\_(2015-12)) - aPriori VPE Manager

File Edit Tools Help

Connected to: Default - Default Scenarios Logged in as: bfrederick

VPE: aPriori USA

Name sand  
 File Path lookupTables\Component\sand.csv  
 Lookup Key name  
 Lookup Type Name Component//sand  
 Stored Type Name Component//sand  
 Table Class Name com.fbc.datamodel.costmodel.casting.Sand

Edit

Name	Description	Density (kg / m <sup>3</sup> )	Disposal Cost (USD / kg)	New Cost (USD / kg)	Recycle Cost (USD / kg)
airSetSand	Air Set Sand	1,600.00	0.0000	0.3300	0.0264
co2Sand	CO2 Sand	1,600.00	0.0000	0.1101	0.0000
greenSand	Green Sand	1,600.00	0.0000	0.0165	0.0013
hotBoxSand	Hot Box Sa...	1,600.00	0.0000	0.6608	0.0000
isocureSand	Isocure Sand	1,600.00	0.0000	0.2203	0.0000
noBakeSand	No Bake Sa...	1,600.00	0.0000	0.3300	0.0264
oilSand	Oil Sand	1,600.00	0.0000	0.2643	0.0000
shellSand	Shell Sand	1,600.00	0.0000	0.1762	0.0000

## To export from the command line

aPriori provides the ability to export VPE data (and optionally, lookup tables) to Excel spreadsheets from the command line. This requires some configuration as explained below.

- 1 Open the following file in a text editor:

```
<apriori_install_dir>\bin\exportVpeDataToExcel.properties
```

#### 4 Edit the lines highlighted below as necessary:

```
templateFile=ext/project-management-plugin/macro/ide/exportMultipleVPESData.xml
inputs.vpeFolder=<Enter destination folder here>
inputs.exportVPES=CSL(asList(asMap('plantName', '<Enter VPE name here>'))))
inputs.exportVPELevelData=true
inputs.exportMaterials=true
inputs.exportMachines=true
inputs.exportToolShops=true
inputs.exportLookupTables=false
inputs.useXls=false
```

**Basic example --** The edited file below will export data from the "aPriori USA" VPE to Excel spreadsheets located in D:/aaa\_tmp/000\_vpe\_export\_folder:

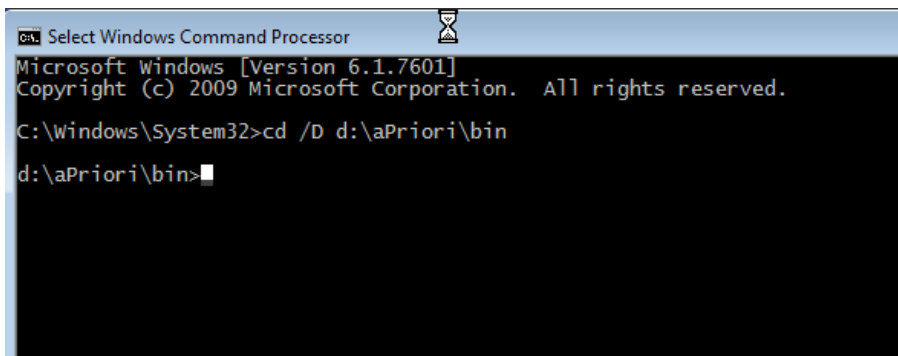
```
templateFile=ext/project-management-plugin/macro/ide/exportMultipleVPESData.xml
inputs.vpeFolder= D:/aaa_tmp/000_vpe_export_folder
inputs.exportVPES=CSL(asList(asMap('plantName', ' aPriori USA'))))
inputs.exportVPELevelData=true
inputs.exportMaterials=true
inputs.exportMachines=true
inputs.exportToolShops=true
inputs.exportLookupTables= false
inputs.useXls=false
```

**Note:** The vpeFolder path MUST use forward slashes ("/"), not Windows back slashes ("\").

**Advanced example --** The edited file below additionally includes lookup tables, and exports from multiple VPES ("aPriori USA" and "aPriori Mexico") to older-style .xls (not .xlsx) files:

```
templateFile=ext/project-management-plugin/macro/ide/exportMultipleVPESData.xml
inputs.vpeFolder= D:/aaa_tmp/000_vpe_export_folder
inputs.exportVPES=CSL(asList(asMap('plantName', 'aPriori USA'), asMap('plantName',
'aPriori Mexico'))))
inputs.exportVPELevelData=true
inputs.exportMaterials=true
inputs.exportMachines=true
inputs.exportToolShops=true
inputs.exportLookupTables= true
inputs.useXls=true
```

#### 5 Open a command console and change to the aPriori installation bin directory. In this example, aPriori is installed at the root of the D: drive. Adjust as necessary for your installation.



```
CA Select Windows Command Processor
Microsoft Windows [Version 6.1.7601]
Copyright (c) 2009 Microsoft Corporation. All rights reserved.

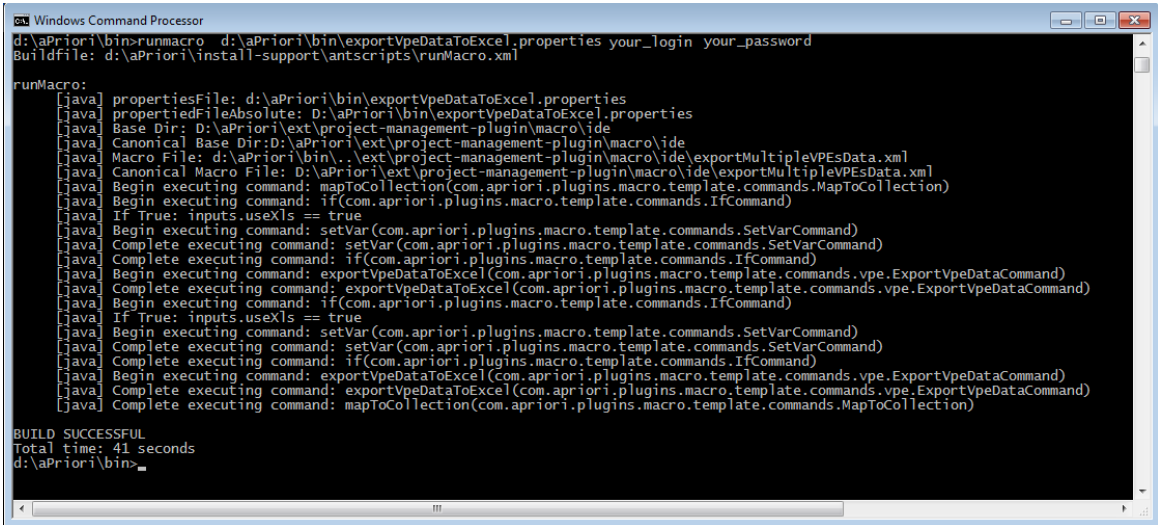
C:\Windows\System32>cd /D d:\aPriori\bin
d:\aPriori\bin>
```

#### 6 Execute the following command line, substituting your actual values for the aPriori installation directory and your login credentials:

```
runMacro <apriori_install_dir>\bin\exportVpeDataToExcel.properties
<your_apriori_login> <your_apriori_password>
```

**Note:** You MUST specify the complete aPriori installation path. If you specify a relative path (such as ".\exportVpeDataToExcel.properties", the command will fail.

As the export command runs it displays status on the console. Watch for error messages -- most common errors are due to back slashes in the properties file and relative pathnames in the command line. The export can take several minutes to complete, so if it looks like it is hanging, give it plenty of time before you decide to cancel.

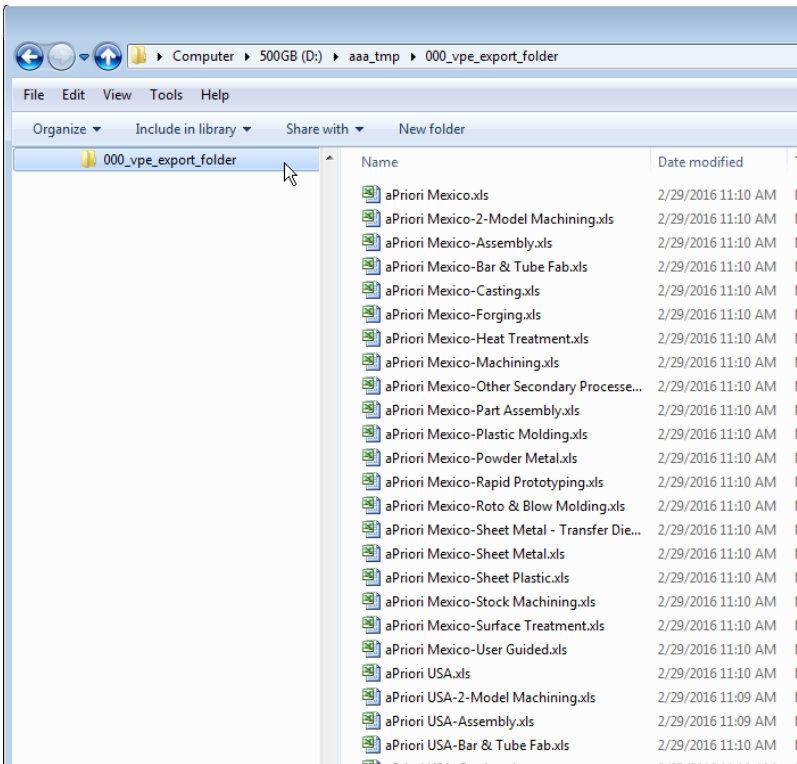


```
Windows Command Processor
d:\aPriori\bin-runmacro d:\aPriori\bin\exportVpeDataToExcel.properties your_login your_password
Buildfile: d:\aPriori\install-support\antscripts\runMacro.xml

runMacro:
[ava] propertiesFile: d:\aPriori\bin\exportVpeDataToExcel.properties
[ava] propertiesFileAbsolute: D:\aPriori\bin\exportVpeDataToExcel.properties
[ava] Base Dir: D:\aPriori\ext\project-management-plugin\macro\ide
[ava] Canonical Base Dir: D:\aPriori\ext\project-management-plugin\macro\ide
[ava] Macro File: d:\aPriori\bin\.\ext\project-management-plugin\macro\ide\exportMultipleVPEsData.xml
[ava] Canonical Macro File: D:\aPriori\ext\project-management-plugin\macro\ide\exportMultipleVPEsData.xml
[ava] Begin executing command: mapToCollection(com.apriori.plugins.macro.template.commands.MapToCollection)
[ava] Begin executing command: if(com.apriori.plugins.macro.template.commands.IfCommand)
[ava] If True: inputs.useXls == true
[ava] Begin executing command: setVar(com.apriori.plugins.macro.template.commands.SetVarCommand)
[ava] Complete executing command: setVar(com.apriori.plugins.macro.template.commands.SetVarCommand)
[ava] Complete executing command: if(com.apriori.plugins.macro.template.commands.IfCommand)
[ava] Begin executing command: exportVpeDataToExcel(com.apriori.plugins.macro.template.commands.vpe.ExportVpeDataCommand)
[ava] Complete executing command: exportVpeDataToExcel(com.apriori.plugins.macro.template.commands.vpe.ExportVpeDataCommand)
[ava] Begin executing command: if(com.apriori.plugins.macro.template.commands.IfCommand)
[ava] If True: inputs.useXls == true
[ava] Begin executing command: setVar(com.apriori.plugins.macro.template.commands.SetVarCommand)
[ava] Complete executing command: setVar(com.apriori.plugins.macro.template.commands.SetVarCommand)
[ava] Complete executing command: if(com.apriori.plugins.macro.template.commands.IfCommand)
[ava] Begin executing command: exportVpeDataToExcel(com.apriori.plugins.macro.template.commands.vpe.ExportVpeDataCommand)
[ava] Complete executing command: exportVpeDataToExcel(com.apriori.plugins.macro.template.commands.vpe.ExportVpeDataCommand)
[ava] Complete executing command: mapToCollection(com.apriori.plugins.macro.template.commands.MapToCollection)

BUILD SUCCESSFUL
Total time: 41 seconds
d:\aPriori\bin>
```

When done, your export folder should contain Excel files for the process groups plus an index file for each VPE you specified.



## VPE Import operations

You can import exported VPEs into the VPE Manager, either one at a time, or several all at once. You may want to do this when installing a regional data library update, or when moving a modified VPE from a testing environment into production.

You can also import just certain portions of a VPE that reside in spreadsheets created by various export commands, such as data, site variables, processes, or lookup tables. This can be useful if you want to take advantage of information in one VPE (or another process group) and add it to a different VPE (or process group).

### To import a single VPE

- 1 Select **File > Import > VPE...** from the aPriori VPE Manager menu bar to display the **Import VPE Files** window.
- 7 Navigate to the folder that contains the VPE you want to import and select it.  
You can select any VPEs that has been exported as a Microsoft Excel (.xls) or compressed (.vpe.zip) file.  
If a compressed file was created in a different version of aPriori, you will not be able to import it.
- 8 Click **Open** to import the selected VPE and display the imported files in the **Loaded VPE** window.  
If the imported VPE has the same name as an existing VPE, the existing VPE will be overwritten.
- 9 Click **OK**.

### To import multiple VPEs

This option is particularly useful when importing updated Regional Data Libraries, or when importing backup VPE files.

- 1 Select **File > Import > Import Multiple VPEs...** from the aPriori VPE Manager menu bar to display the **Import Multiple VPEs** window.
- 2 Navigate to the folder that contains the VPEs that you want to import.
- 3 Read the Usage Notes in the window to aid you in your selection. Note that you can import only files with .vpe.zip extensions.
- 4 Click **OK**.

### To import site variables

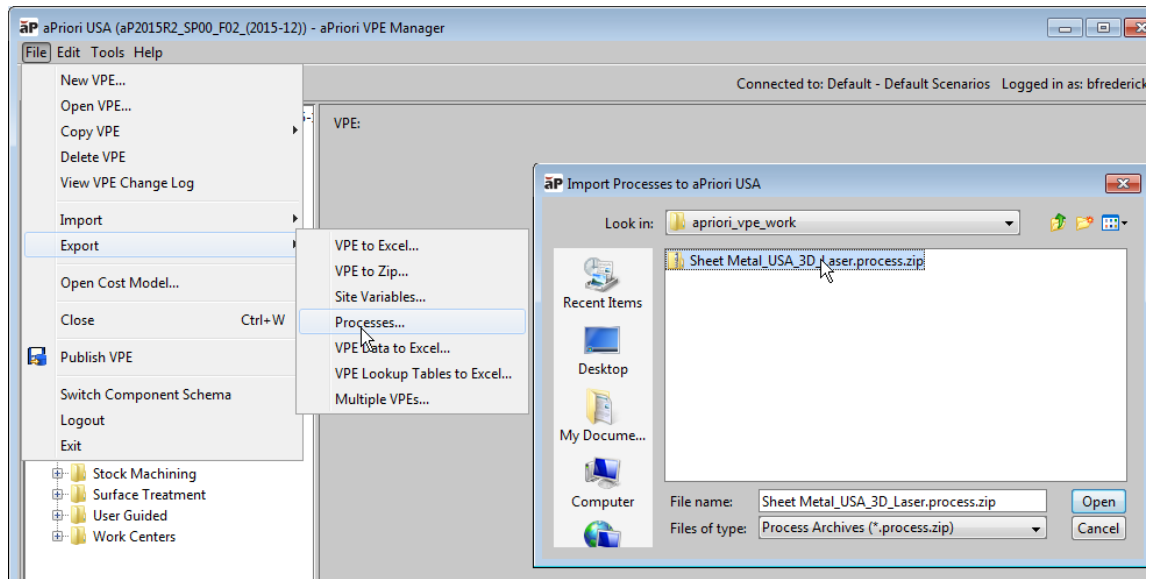
See *To import site variables into a deployment* on page98 .

## To import processes

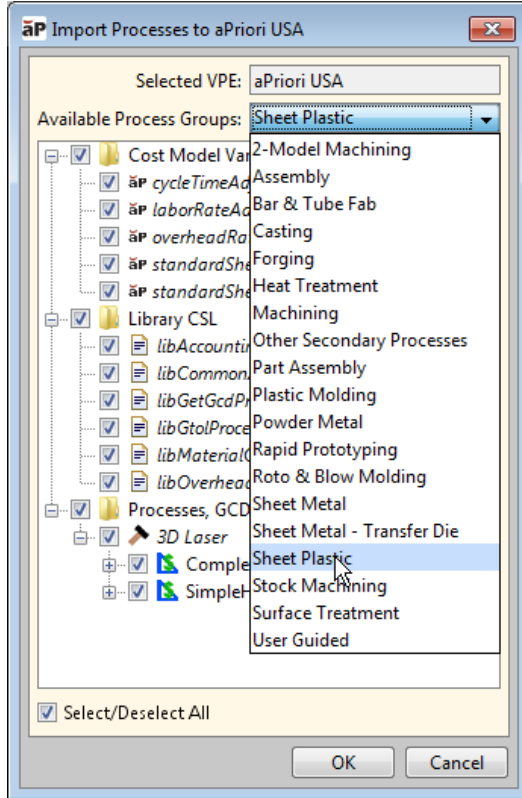
Use this option to import spreadsheets that were created with the export processes command. See *Exporting, modifying, and importing processes* on page 59 for information about when and how to use aPriori's process import/export capabilities.

**Note:** If a branch node has nothing defined in it (for example, no node attributes, CSL, lookup tables, process setup options, etc.), then it is skipped/ignored on import.

- 1 Open the VPE which contains the process group into which you wish to import the exported process(es). (See *To export processes* on page 20.)
- 2 From the VPE Manager tool bar click **File > Import > Process...** Then in the **Import Processes** dialog, navigate to the `.process.zip` containing the exported process(es) that you wish to import, then click **OK**.



- 3 In the resulting **Import Processes** dialog, select the process group into which you want to import the process. Then select the elements of the process which you wish to import, and leave unchecked anything that you do not want to import. (In this example, we are importing all elements into the **Sheet Plastic** process group.) Click **OK** when done.



- 4 Once the process has been imported into the process group, you can modify it as necessary (see the *Cost Model Workbench User Guide*).

## To Import VPE Data from Excel

The VPE Manager provides the ability to import VPE data such as materials, machines, plant variables, and tool shops from Excel spreadsheets. Typically, these spreadsheets would have been previously exported and perhaps modified with updated information before being imported into a VPE (either a different VPE, or the same VPE form which it was originally exported). This mechanism is very useful for doing VPE maintenance such as updating labor rates, material rates, and other data elements that must be revised in the VPE on a regular basis.

For more information about the format of these spreadsheets and how to create them, see *To export VPE Data to Excel* on page 24.

- 1 Open the VPE Manager on the VPE to which you want to import the data, and from the tool bar click **File > Import > VPE Data from Excel**.

**Note:** Alternatively, you can open a specific VPE from within the VPE Manager and then right-click the top entry in the left-hand navigation pane and select **Import > All VPE Data to Excel...** from the context menu.

- 2 Navigate to and click the index Excel file. (This is the one *without* a process group embedded in its name. For example, if you had previously exported the data from the



aPriori USA VPE and kept the default name, the index file would be "aPriori USA.xls".)

- 3 Click **Open**.

**Note:** If aPriori displays an error message when you try to import, double-check that you have not selected one of the process group files or another incorrect spreadsheet. You **MUST** select the index spreadsheet.

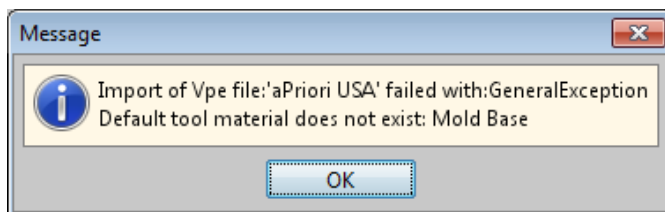
The import can take several minutes if it consists of many process groups. Asterisks appear next to process groups in the Navigation pane if they have been modified by the import.

- 4 (Optional.) When prompted, either enter a description of your changes and click **OK** or click **Skip Log**.
- 5 (Optional.) When prompted to publish the VPE, click **yes**.

**Note:** Imported data will not be available to other VPE users unless you **Publish**.

**IMPORTANT NOTE ABOUT PRE-16.1 VPES:** If you have upgraded to 16.1 from a previous release and use the **Export VPE Data to Excel** feature, you will encounter an error when re-importing these spreadsheets unless you perform the manual fix described below.

The error is "Default tool material does not exist: Mold Base".



To avoid this error, perform the following steps before using **Import VPE Data from Excel**. This procedure is necessary **ONLY** if you upgraded to 16.1 from an earlier release.

- 1 Open the Plastic Molding spreadsheet in Excel. (This spreadsheet should have name similar to "<vpeName>-Plastic Molding.xls".)
- 2 Go to the "Injection\_Molding\_tShops" tab. (The "\_tShops" tabs are to the far right in the workbook.)
- 3 Under the "Default Tool Material Name" column, change "Mold Base" to "Steel". (If the value in this cell is already "Steel", your VPE is already up-to-date and you do NOT need to perform this fix.)



aPriori USA-Plastic Molding.xls [Compatibility Mode]

	A	B	C	D	E	F	G	H	I	J	K	
1	<u>Edit</u> <u>Operation</u>	<u>Name</u>	<u>Assembly</u> <u>Rate (USD /</u> <u>hr)</u>	<u>CM Mrate</u> <u>(USD / hr)</u>	<u>Default Tool</u> <u>Material</u> <u>Name</u>	<u>Description</u>	<u>Design Rate</u> <u>(USD / hr)</u>	<u>Duty Rate</u> <u>(USD / kg)</u>	<u>Edm Material</u> <u>Cost Carbon</u> <u>(USD / in^3)</u>	<u>Edm Material</u> <u>Cost Copper</u> <u>(USD / in^3)</u>	<u>EDM Rate</u> <u>(USD / hr)</u>	<u>Frei</u> <u>(USD</u>
2		Default	37.12	37.12	Mold Base		33.64	0	2.25	3.81	42.79	
3												
4												
5												
6												
7												

Injection\_Molding Injection\_Molding\_tShops Reaction\_Injection\_Molding\_tSho Structural\_Foam\_Molding\_tShops sheet1

- Repeat Step 3 for the "Reaction\_Injection\_Molding\_tShops" tab and the "Structural\_Foam\_Molding\_tShops" tab.
- Save the Excel spreadsheet. You should now be able to execute **Import VPE Data from Excel** without error.

### To Import VPE Lookup Tables from Excel

The VPE Manager provides the ability to import lookup tables from Excel spreadsheets. Typically, these spreadsheets would have been previously exported and perhaps modified with updated information before being imported into a VPE (either a different VPE, or the same VPE form which it was originally exported).

For information about lookup tables, see the section "Working with Lookup Tables" in the *Cost Model Workbench User Guide*. For information about exporting lookup tables, see *To export VPE Lookup Tables to Excel* on page 33. For an example of how the separately-priced aPriori Wire Harness VPE makes use of lookup table import/export to maintain a Component Library of approved parts, see *Updating the Component Library* starting on page 139.

**Note:** When you need to remove rows when editing a lookup table spreadsheet, it is critical that you do not leave empty rows. If you select one or more rows and press the **Delete** key, you remove the contents of the cells but leave the empty rows in place. This will cause problems when you import the spreadsheet into aPriori. Therefore, use the right-mouse-click **Delete** option, and ensure that the rows are removed as well as their content.

- Open the VPE Manager on the VPE to which you want to import the lookup tables, and from the tool bar click **File > Import > VPE Lookup tables from Excel**.
- Navigate to and click the index Excel file. (This is the one *without* a process group embedded in its name. For example, if you had previously exported the lookup tables from the aPriori USA VPE and kept the default name, the index file would be "aPriori USA.xls".)
- Click **Open**.

**Note:** If aPriori displays an error message when you try to import, double-check that you have not selected one of the process group files or another incorrect spreadsheet. You **MUST** select the index spreadsheet.

- 4 Refer to the usage notes in the Import VPE **Lookup Tables from Excel** dialog, and select either **Replace** or **Add** as appropriate. The import can take several minutes if it consists of many process groups. Asterisks appear next to process groups in the Navigation pane if they have been modified by the import.
- 5 (Optional.) When prompted, either enter a description of your changes for the log and click **OK** or click **Skip Log**.
- 6 (Optional.) When prompted to publish the VPE, click yes.

### To import from the command line

aPriori provides the ability to import VPE data (and optionally lookup tables) from Excel spreadsheets from the command line. (For information about creating these spreadsheets, see *To export from the command line*.) This requires some configuration as explained below.

- 1 Open the following file in a text editor:

```
<apriori_install_dir>\bin\importVpeDataFromExcel.properties
```

Edit the lines highlighted below as necessary:

```
templateFile=ext/project-management-plugin/macro/ide/importMultipleVPEsData.xml
inputs.vpeFolder=<Enter source folder here>
inputs.availableVPEs=CSL (asList(asMap('name', '<Enter xls or.xlsx file name for the
imported VPE here>'))))
inputs.importVPELevelData=true
inputs.importMaterials=true
inputs.importMachines=true
inputs.importToolShops=true
inputs.importLookupTables=false
inputs.replaceRows=false
```

**Basic example --** The edited file below will import "aPriori USA" VPE data from the Excel spreadsheets located in `D:/aaa_tmp/000_vpe_export_folder`. The spreadsheet filename you specify in the third line must be that of the index file -- the one that includes only the VPE name, not a process group name.

```
templateFile=ext/project-management-plugin/macro/ide/importMultipleVPEsData.xml
inputs.vpeFolder=D:/aaa_tmp/000_vpe_export_folder
inputs.availableVPEs=CSL (asList(asMap('name', 'aPriori USA.xls'))))
inputs.importVPELevelData=true
inputs.importMaterials=true
inputs.importMachines=true
inputs.importToolShops=true
inputs.importLookupTables=false
inputs.replaceRows=false
```

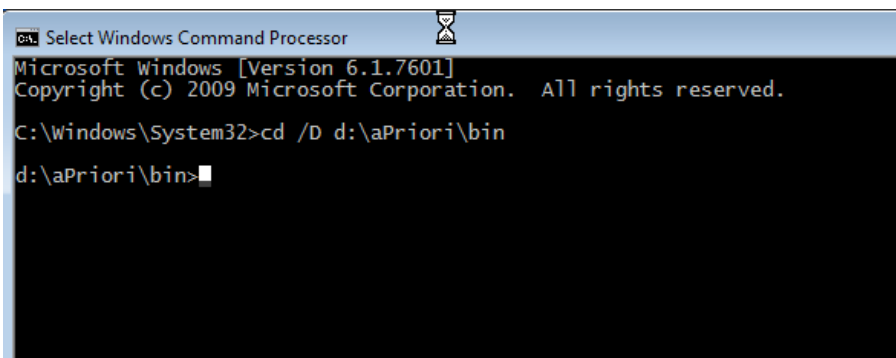
**Note:** The `vpeFolder` path **MUST** use forward slashes ("/), not Windows back slashes ("\).

**Advanced example --** The edited file below additionally includes lookup tables, and also imports multiple VPES ("aPriori USA" and "aPriori Mexico"). It also specifies that

data from the spreadsheet should overwrite any data in the VPE with the same name:

```
templateFile=ext/project-management-plugin/macro/ide/importMultipleVPEsData.xml
inputs.vpeFolder=D:/aaa_tmp/000_vpe_export_folder
inputs.availableVPEs=CSL (asList(asMap('name', 'aPriori Mexico.xls'),asMap('name',
'aPriori USA.xls')))
inputs.importVPELevelData=true
inputs.importMaterials=true
inputs.importMachines=true
inputs.importToolShops=true
inputs.importLookupTables=true
inputs.replaceRows=true
```

- To import lookup tables:** Set `inputs.importLookupTables=true` in the properties file. This allows lookup table data to be imported.
  - If you exported from the command line, by using the `exportVpeDataFromExcel.properties` file with `inputs.importLookupTables=true`, the lookup tables will be exported as part of the Excel sheets containing the data. They can then be imported alongside the rest of the VPE data, as part of those spreadsheets that were previously exported.
  - If you exported from the **VPE Manager UI**, by using **File > Export > VPE Lookup Tables to Excel**, the lookup tables will be exported independently of the data. The Excel spreadsheets will only contain lookup tables and will have the same names as those containing VPE data, so they cannot both be imported at the same time.
- Open a command console and change to the aPriori installation `bin` directory. In this example, aPriori is installed at the root of the D: drive. Adjust as necessary for your installation.



```
Select Windows Command Processor
Microsoft Windows [Version 6.1.7601]
Copyright (c) 2009 Microsoft Corporation. All rights reserved.

C:\Windows\System32>cd /D d:\aPriori\bin
d:\aPriori\bin>
```

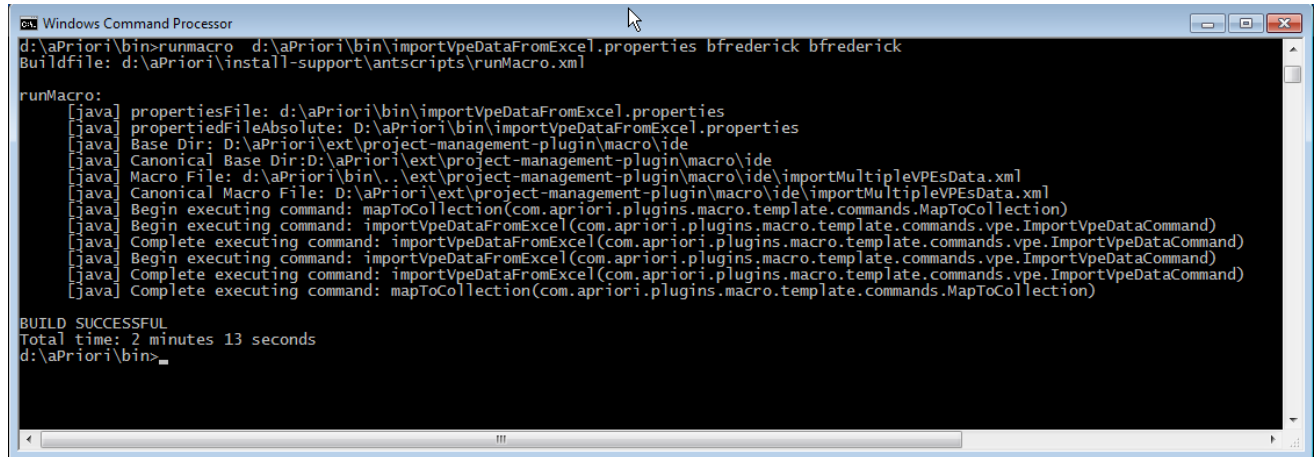
Execute the following command line, substituting your actual values for the aPriori installation directory and your login credentials:

```
runMacro <apriori_install_dir>\bin\importVpeDataFromExcel.properties
<your_apriori_login> <your_apriori_password>
```

**Note:** You MUST specify the complete aPriori installation path. If you specify a relative path (such as `.\importVpeDataFromExcel.properties`), the command will fail.

As the import command runs it displays status on the console. Watch for error messages -- most common errors are due to back slashes in the properties file and

relative pathnames in the command line. The import can take several minutes to complete, so if it looks like it is hanging, give it plenty of time before you decide to cancel.



```
Windows Command Processor
d:\aPriori\bin>runmacro d:\aPriori\bin\importVpeDataFromExcel.properties bfrederick bfrederick
BuildFile: d:\aPriori\install-support\antscripts\runMacro.xml

runMacro:
[Java] propertiesFile: d:\aPriori\bin\importVpeDataFromExcel.properties
[Java] propertiesFileAbsolute: D:\aPriori\bin\importVpeDataFromExcel.properties
[Java] Base Dir: D:\aPriori\ext\project-management-plugin\macro\ide
[Java] Canonical Base Dir:D:\aPriori\ext\project-management-plugin\macro\ide
[Java] Macro File: d:\aPriori\bin\..\ext\project-management-plugin\macro\ide\importMultipleVPEsData.xml
[Java] Canonical Macro File: D:\aPriori\ext\project-management-plugin\macro\ide\importMultipleVPEsData.xml
[Java] Begin executing command: mapToCollection(com.apriori.plugins.macro.template.commands.MapToCollection)
[Java] Complete executing command: importVpeDataFromExcel(com.apriori.plugins.macro.template.commands.vpe.ImportVpeDataCommand)
[Java] Begin executing command: importVpeDataFromExcel(com.apriori.plugins.macro.template.commands.vpe.ImportVpeDataCommand)
[Java] Complete executing command: importVpeDataFromExcel(com.apriori.plugins.macro.template.commands.vpe.ImportVpeDataCommand)
[Java] Complete executing command: mapToCollection(com.apriori.plugins.macro.template.commands.MapToCollection)

BUILD SUCCESSFUL
Total time: 2 minutes 13 seconds
d:\aPriori\bin>
```

When done, your VPE(s) should contain the data from all the Excel files.

**Note:** To see the new VPE data after importing using the command line, it is important to close the VPE and then click **File > Refresh Database Connection** from the main window toolbar.

## Importing a starting point VPE update

You may want to import a starting point VPE that has been updated by aPriori. aPriori starting point VPEs are updated and delivered semi-annually. Updated information typically includes Regional Data Libraries and/or cost model updates such as machining tables for specific processes or cost model logic for specific processes or operations. Each update includes release notes that explain the changes that have been made and the trends in the Regional Data Libraries.

aPriori Customer Support will provide you with a URL link to the specific update files that are appropriate for your version of aPriori software.

Updates must be loaded from a computer which has aPriori installed and is on the same local area network (LAN) as the database server. The amount of time the update will take is dependent on the connection to the database and the number of regions to be updated.

**Note:** If you try to load updates from a machine which is not on the same LAN as the database server, the update may take many hours to complete.

Your aPriori user ID must have administrator privileges to import VPE updates. aPriori recommends notifying the end users when the update will take place. Users may remain connected to the system during the update. The updates are effective immediately and the end users may notice cost differences as the updates happen.

**Note** Starting point VPE updates are sometimes compatible only with certain versions of aPriori. Please consult the relevant *Release Notes* for the aPriori starting point VPE update and work with aPriori Customer Support to determine if a specific update is appropriate for your needs and environment.

### To import a starting point VPE update

The most up-to-date procedure for installing an update will be in the Release Notes that accompany the update. These steps typically include the following.

*Downloading the files and importing the baseline update file:*

- 1 Download the package provided by aPriori Customer Support to a local folder. This folder should contain the following content:
  - A license file: `<filename>.apz`
  - A baseline update file: `baseLineUpdate-<version_numbers>.apx`
  - Regional Data Library region files: `<region_name>.vpe.zip`
- 2 Import the new license file (the user who completes this step must be configured as a System Administrator in the aPriori environment)
- 3 Import the baseline update file (the user who completes this step must be configured as a VPE Manager in the aPriori environment)
- 4 From the aPriori client, click **Tools > VPE Toolset**
- 5 In the VPE Toolset, click **File > Import > aPriori Baseline Update...**
- 6 Navigate to the baseline update file, select it, and click **Open**.

**Note:** If you downloaded the file using Internet Explorer, the original file extension (`.apx`) may have been changed to `.zip`. By default, the file browser only displays files with `.apx` extensions, so you will need to either select **All files** in the **Files of type:** field or change the file extension of the update back to `.apx`.

- 7 Click **OK**.

While the update is being loaded, you will see the progress in the lower right corner of the VPE Manager Toolset.

- 8 When the update completes, a message pops up confirming that the update was successful.

Click **OK**.

### *Importing the Regional Data Libraries*

The previous steps must be completed before starting the steps below. To complete these steps, you must be a VPE Administrator.

**Note:** . The process below assumes that you have configured your installation with an aPriori Macro that enables you to import multiple VPEs at one time. You must contact your aPriori account representative to discuss installing this macro. It is possible to install the Regional Data Library files one by one without this macro (using the standard VPE Toolset menu **File > Import > VPE...**), but the procedure will take much longer and requires much more interaction.

- 1 From the VPE Toolset click **File > Import > Multiple VPEs...**

**Note:** This option is available only if you have installed the aPriori Macro mentioned above.

Follow the steps in the resulting window to locate and import the VPE files:

- 2 Select a local directory that contains all of the regional data libraries (.vpe.zip files).
- 3 Select the VPE files you wish to import
- 4 Click **OK**.

**Note:** While the update is being loaded, you will only see a progress bar in the bottom right corner of the aPriori client, not the VPE Toolset window.

- 5 When the import completes, a message pops up confirming that the update was successful.  
Click **OK**.

## Deleting a VPE

You can delete a VPE if it has become outdated or to remove a VPE created for training.

**Note:** You cannot delete a VPE which:

- is the default VPE for a process group.
- has overlay VPEs that inherit from it.

### To delete a VPE

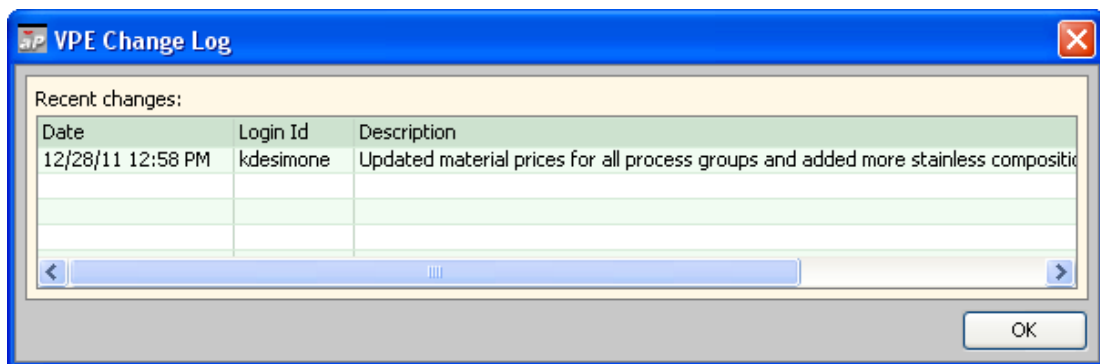
- 1 Open the VPE you want to delete.  
For more information, see *Opening a VPE* on page 9.
- 2 Select **File > Delete VPE** from the aPriori VPE Manager menu bar to display the **Delete VPE** window.
- 3 Click **OK** to delete the VPE.

## Viewing a VPE change log

When a VPE is exported, information can be entered into the VPE change log. You can view this log when the VPE is imported. For more information, see *VPE* on page 18 and *VPE* on page 38.

### To view a VPE's change log

- 1 Open the VPE for which you want to view the change log.  
For more information, see, see *Opening a VPE* on page 9.
- 2 Select **File > View VPE Change Log** from the aPriori VPE Manager menu bar to display the **VPE Change Log** window.

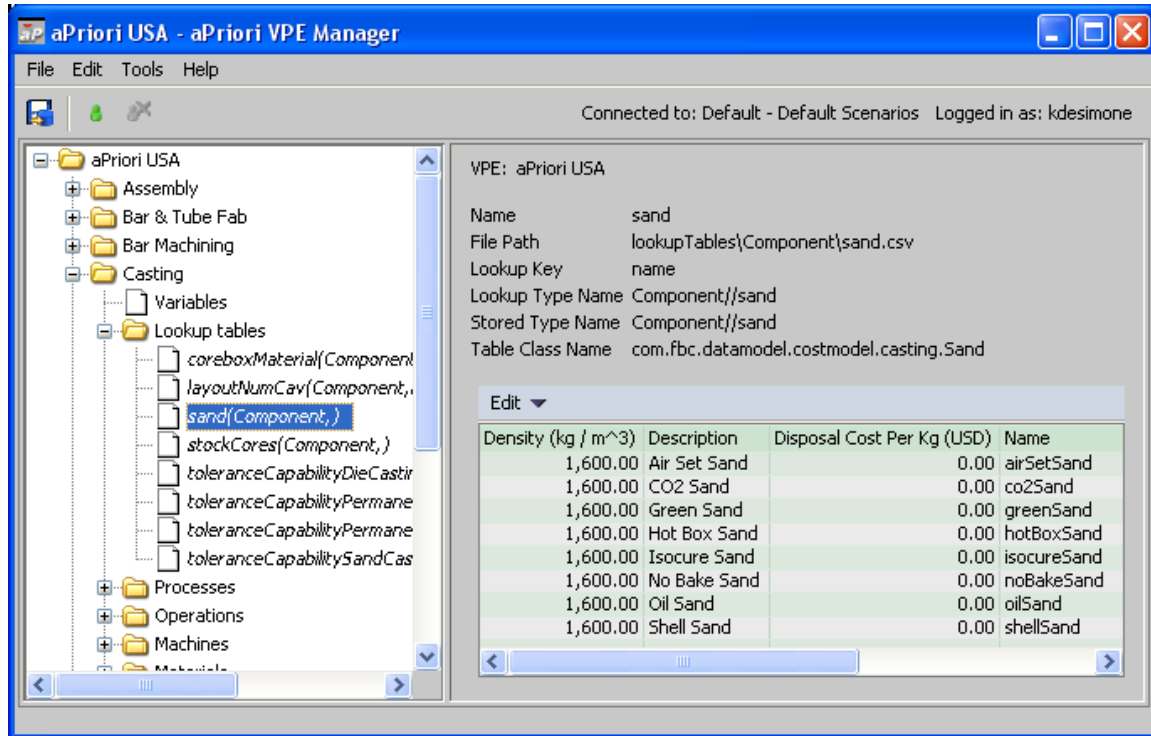


- 3 Click **OK** to close the change log.


## Editing VPEs

You can use the aPriori VPE Manager to edit virtual production environment (VPE) data. This data includes facility data, such as variables, lookup tables, processes, operations, machines, and materials.

When you open a VPE, the data for the VPE is organized in the navigation list on the left. Select a folder or file to display its data on the right.



All VPEs have a consistent file structure. You can:

- Click the top-level VPE folder to display general facility data and usage information, such as a description, objective, and usage guidelines and limitations.
- Click each process group folder to display the cost model version and default material name. The Notes field contains information displayed to aPriori users on the **VPE Details** window.
- Click  or double-click a process group to expand it:

**Variables** display the plant variables for the processes used in the selected VPE's cost model.

**Lookup tables** display lookup tables, such as handling times or cut rates.

**Processes** display the default tool shop and default machine for each process. The **Notes** cell contains information displayed to aPriori users in the **VPE Details** window.

**Operations** display the operations associated with each process.

**Machines** display machine descriptions, rates, speeds, and feeds.

**Materials** display the material list and composition, sheet size, and rate data.

All the VPEs provided with your installation of aPriori have been created and tested to reflect specific costing behavior. Changes to these VPEs will impact cost estimates for all components using the VPE. We recommend that you use the following best practices to ensure that VPE changes are applied in a controlled and consistent manner:

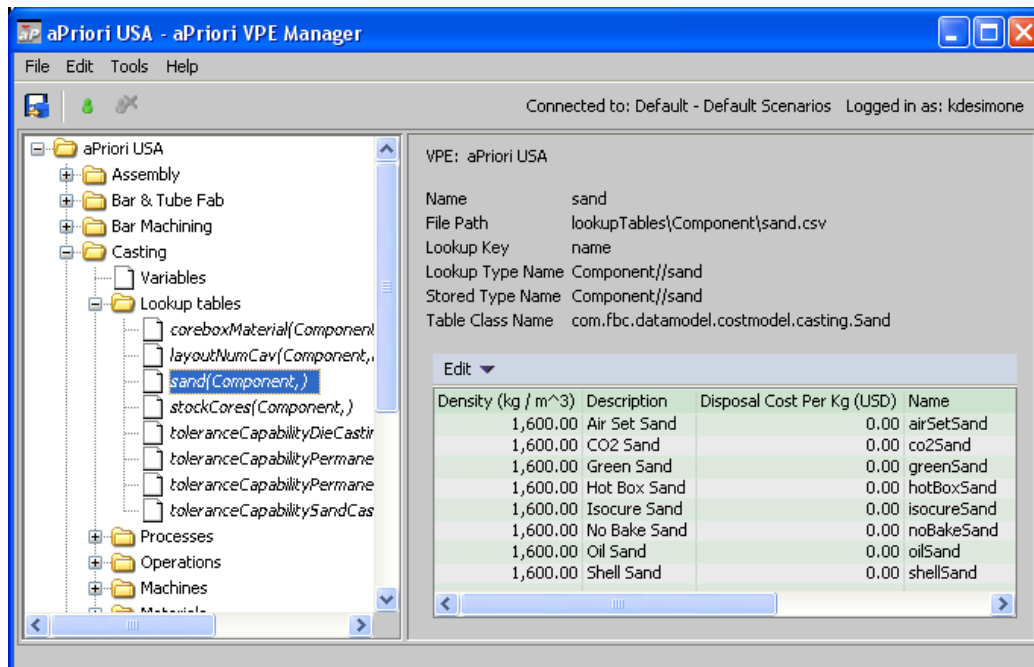


- Make any VPE modifications in a staging environment before moving them to production.
- Create a data maintenance plan for each VPE to ensure that VPE data is kept current.
- Ensure that anyone editing VPE data attends aPriori Administrator training or engages with aPriori Professional Services for support.

## To edit a VPE

- 1 Open the VPE you want to edit.

The VPE is displayed in the aPriori VPE Manager. You cannot edit aPriori starting point VPEs. For more information, see , see *Opening a VPE* on page 9.





- 2 Save a copy of the VPE as a backup.

For more information, see *VPE* on page 18.

- 3 Edit the VPE data.

You can use the aPriori VPE Manager to add or delete the machines and materials in each process group. You also can edit machine, material, and other VPE data. For more information, see *Adding machine and material data* on page 51, *Editing VPE data* on page 59, and *Deleting machine and material data from a VPE* on page 64.

- 4 Select **File > Publish VPE** from the aPriori VPE Manager menu bar or click  in the toolbar to save your changes.

- 5 Select **File > Close**, press **Ctrl+W**, or click  on the title bar to close the VPE Manager and return to the aPriori VPE Toolset window.

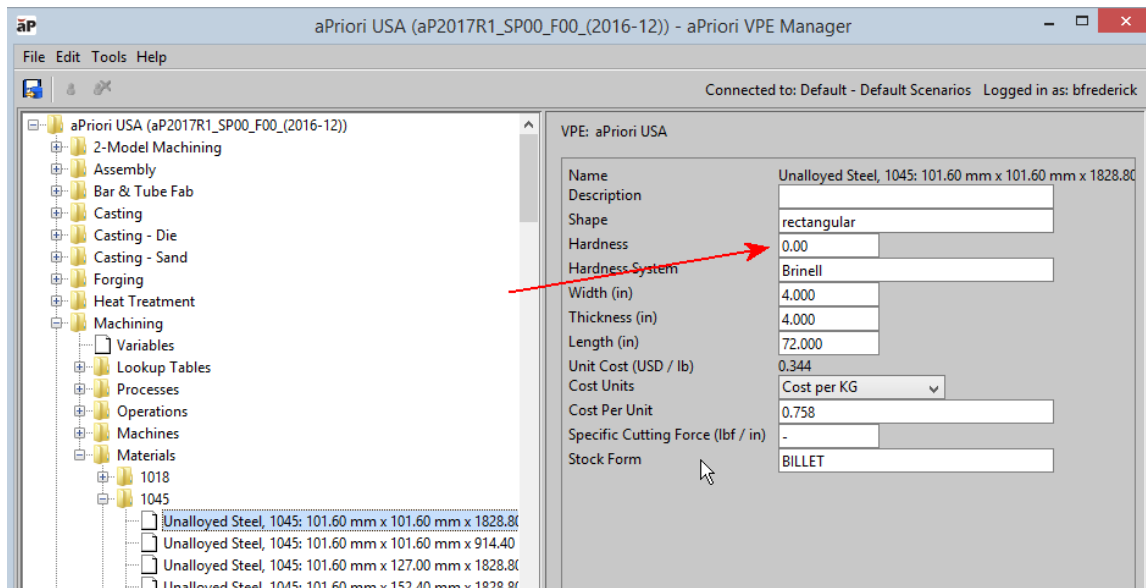
## Adding machine and material data

Add machine, material type, and stock data to a VPE when the VPE does not contain the machines or materials used by your facility.

If you want to add a large number of machines or materials to the VPE, we recommend that you export the VPE data and add the new machines or materials in Excel, then import it. For more information, see *To export VPE Data to Excel* on page 24 and *To Import VPE Data from Excel* on page 40 .

A note about material hardness

By default, most material hardness values are set to “0.00” in the VPE Manager “Materials” UI. In this case, aPriori cost models will derive a reasonable hardness value from internal tables at costing time, if you have a specific hardness value that you want to be used for costing, you can provide an override value.



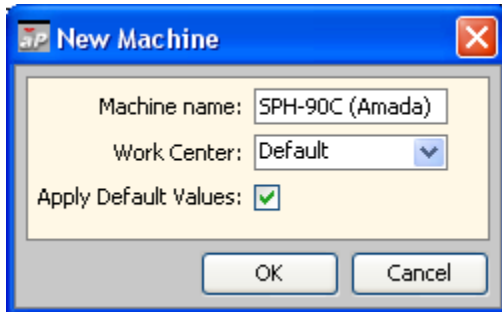
### To add a machine

- 1 Open the VPE to which you want to add a machine.

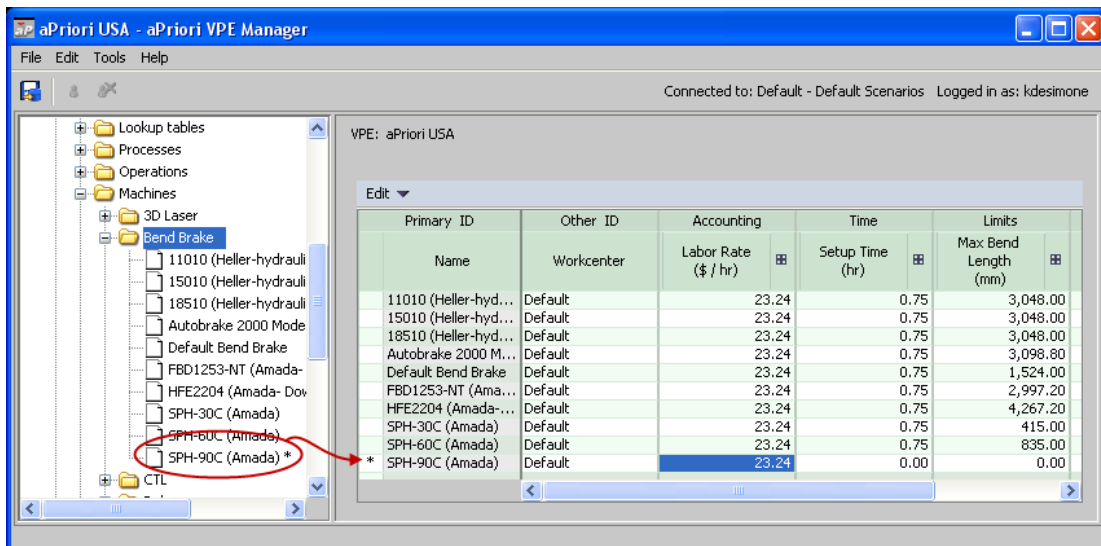
The VPE is displayed in the aPriori VPE Manager. For more information, see *Opening a VPE* on page 9. Expand the process group to which you want to add a machine.

- 2 Expand the **Machines** folder.
- 3 Expand the machine type folder for the type of machine you want to add.

- Right-click the machine type folder and select **Create new machine** from the context menu to display the **New Machine** window.



- Enter the machine's name and select the work center. Check **Apply Default Values** if you want to use the values from the default machine to populate the new machine's data.
- Click **OK** to add the new machine as a new file in the Navigation pane and as a new row in the machine type table in the Data pane.



- Click the machine in the Navigation pane to edit the machine's properties.


If you are editing directly in the table, you can click in the column header to expand the column and display its sub-columns. Click to collapse the sub-columns.

As you edit, an asterisk (\*) appears next to the file in the Navigation pane and next to the row to indicate that there are unsaved changes.

For example, in the figure above, a new bend brake SPH-90C (Amada) machine was added. It appears as the last file in the **Bend Brake** list in the Navigation pane and as the last row in the table. Because the labor rate was edited, an asterisk appears next to the machine.

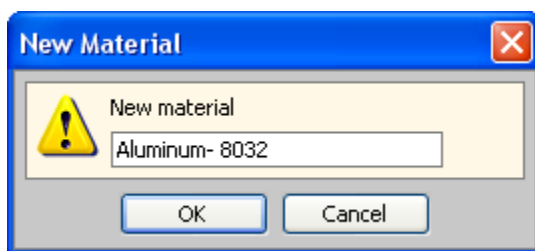
## To add or update a machine field

You can add or update a column in the machine table across all processes in a process group at once, rather than making the same change to each distinct process machine table. This feature is useful if your company wishes to add a column to all machine tables in a VPE, such as “Factory Location.”

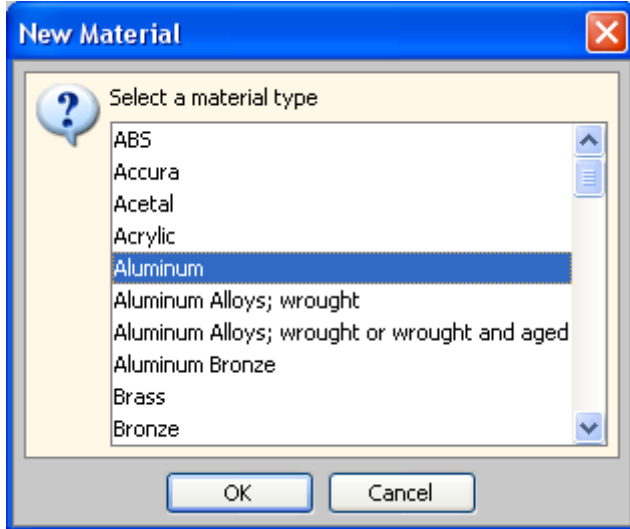
- 1 In the VPE Toolset (or the Cost Model Workbench), open a VPE and select the process group you wish to change.
- 2 From the menu bar, click **Tools > Add/Update machine field**.
- 3 Enter values in the fields in the resulting dialog box and click **OK**.
- 4 The column is added to the table, but it will not actually be populated with data.
- 5 Select **File > Publish VPE** from the aPriori VPE Manager menu bar or click  in the toolbar to save your changes.
- 6 Input values into the field through the VPE Manager.

## To add a material

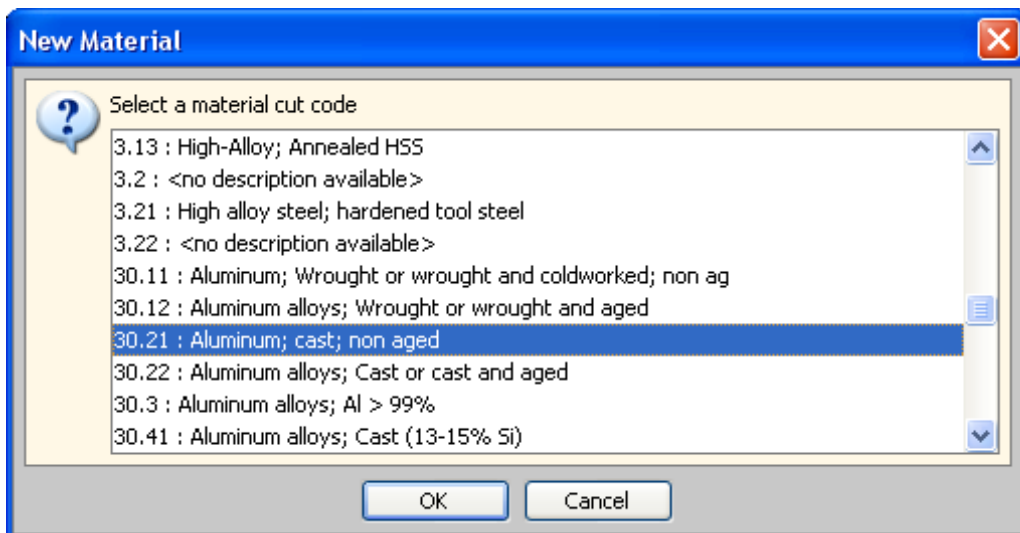
- 1 Open the VPE to which you want to add a material.  
The VPE is displayed in the VPE Manager. For more information, see *Opening a VPE* on page 9.
- 2 Expand the process group to which you want to add a material.
- 3 Expand the **Materials** folder.
- 4 Right-click the **Materials** folder and select **Add material** from the context menu to display the **New Material** window.



- 5 Enter a name for the material and click **OK** to display a list of material types.



- 6 Select a material type and click **OK** to display a list of material cut codes.



A material's cut code characterizes the machinability of a material and is adapted from the Sandvik Cormorant cutability classification (CMC code) scheme for metals. Different materials that machine similarly are assigned the same cut code. For example, both Inconel and Hastelloy are assigned a cut code of 20.21 as they are both nickel-based, heat resistant super-alloys.

For more information on assigning material cut codes, see *Assigning material cut codes* on page 76.

- 7 Select a material cut code and click **OK** to add the new material as a new item in the Navigation pane and as a new row in the **Materials** table in the Data pane.
- 8 Click the material in the Navigation pane to edit the material's properties.

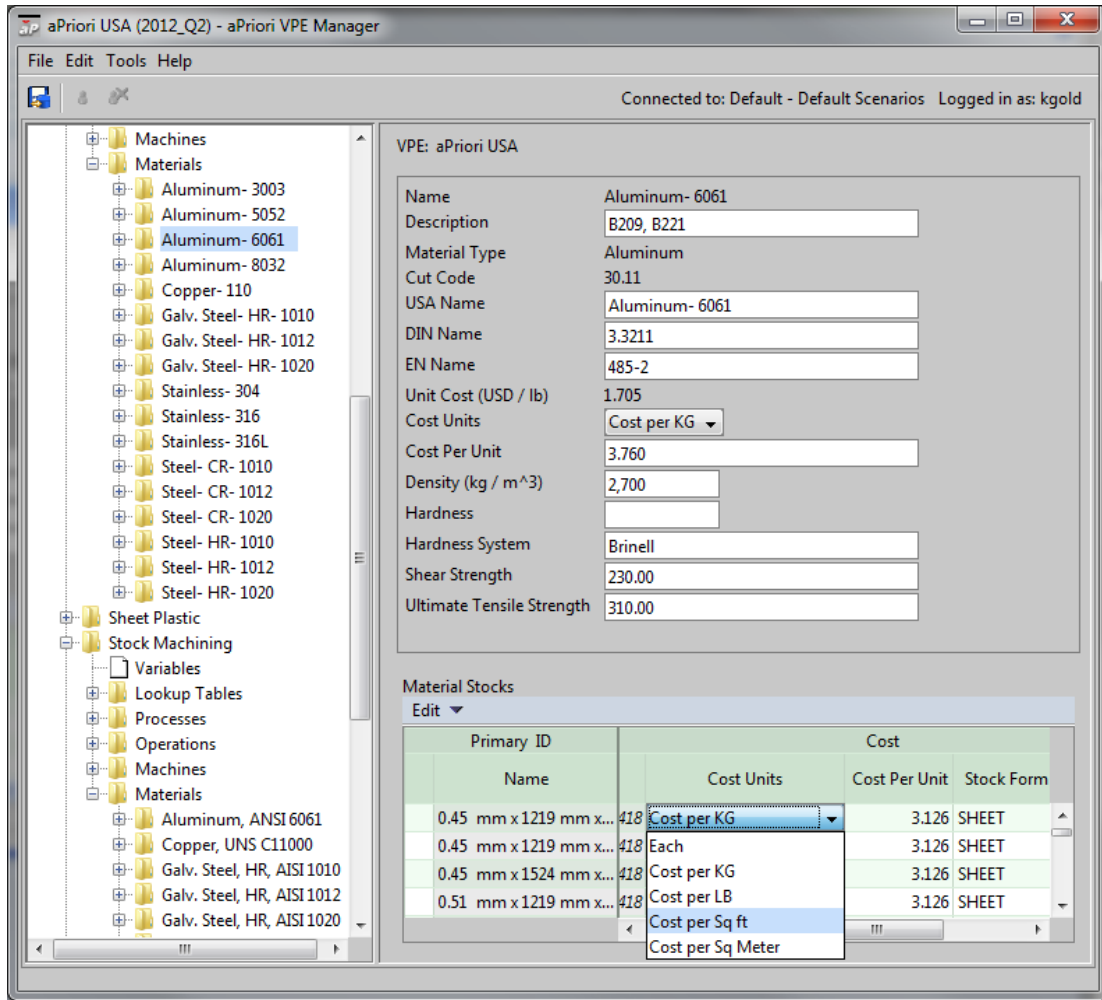
Material properties vary by process group. Review the cost model to understand the role that material properties play in calculating cost. Typically, once a material is added, the only value that changes over time is the Unit Cost.

Common material properties include:

- **Density** – The density of the material
- **USA Name, DIN Name, and EN Name** – These properties reflect the name or standard by which the material is known in the US, Germany, and UK, respectively. They are optional fields that may be populated in addition to the primary Name field.
- **Cost Units** – Material cost data can be entered in multiple units systems. Select one of the following unit types from the drop-down list:
  - **Cost per KG** – Available for all process groups
  - **Cost per LB** – Available for all process groups
  - **Cost per Square Foot** – Available for the Sheet Metal process group
  - **Cost per Square Meter** – Available for the Sheet Metal process group
  - **Cost per Linear Foot** – Available for the Bar & Tube Fabrication and Forging groups
  - **Cost per Linear Meter** – Available for the Bar & Tube Fabrication and Forging groups
  - **Cost per Item (Each)** – Cost for an individual stock item of the specified size. Available for some process groups

Regardless of the cost units chosen, costs are converted as appropriate and displayed in cost per mass units in the aPriori interface. That is, in the aPriori interface, material unit costs are displayed as Cost per Kg or Cost per Lb, depending on whether the user has chosen Metric or English units for display.

- **Cost per Unit** – Material unit cost based on the selected Cost Units




**Note:** When you add a material with cut code 4.0 or 4.1, please specify **Rockwell C** as the **Hardness System** field value. When you add a material with cut code 23.1, 23.21, or 23.22, please specify **Tensile Strength** as the **Hardness System** field value. See A note about material hardness for more information.

- 9 Add material stocks to the material type folder following the instructions in *To add a material stock* below.

## To add or update a material field



You can add or update a column in the material table across multiple process groups in a VPE at once, rather than making the same change to each process group individually. This feature is useful if your company needs to add a column to all material tables in a VPE, such as “Company Description.”

- 1 In the VPE Toolset (or the Cost Model Workbench), open a VPE.
- 2 From the menu bar, click **Tools > Add/Update material field**.
- 3 Enter the fields in the resulting dialog box. Use **CTRL-left-click** and **SHIFT-left-click** to extend your selection of process groups from the **Select Process Group(s)** field.
- 4 When you click **OK**, a window will open for each process group you selected as it is updated. You can dismiss these windows when done.
- 5 The column is added to the table, but it will not actually be populated with data.
- 6 Input values into the field through the VPE Manager.
- 7 Select **File > Publish VPE** from the aPriori VPE Manager menu bar or click  in the toolbar to save your changes.

## To add a material stock

- 1 Open the VPE to which you want to add a material stock.  
The VPE is displayed in the aPriori VPE Manager. For more information, , see *Opening a VPE* on page 9.
- 2 Expand the process group to which you want to add a material stock.  
Material stocks are available for the Bar & Tube Fabrication, Forging, Sheet Metal, and Stock Machining process groups.
- 3 Expand the **Materials** folder.
- 4 Expand the material type folder for the type of material stock you want to add.
- 5 Right-click the material type folder and select **Add material stock** from the context menu to display the **New Material Stock** window.
- 6 Enter a name for the material stock and click **OK** to add the new material stock as a new file in the Navigation pane and as a new row in the **Materials** table in the Data pane.
- 7 Enter data directly in the **Material Stocks** table cells or click the material stock in the Navigation pane to enter the values in fields.



If you are editing directly in the table, you can click  to expand a column and display its sub-columns. Click  to collapse the sub-columns.

As you edit, an asterisk (\*) appears next to the file in the Navigation pane and next to the row to indicate that there are unsaved changes.

## To add a tool shop

A *tool shop* is a set of variables to calculate tooling related costs. A tool shop is something like a miniature VPE but is tooling specific. They have no CSL but store data such as relative costs for different die materials, and can be used by a process that makes use of tooling such as molds, cores, etc. To create a tool shop, you (or an administrator who has permission to use the Cost Model WorkBench) must first create a tool shop *type*, and then associate it with the relevant process. For these initial steps, please refer to the aPriori *Cost Model Workbench Guide*, “Working with Tool Shop Metadata”.

Once the initial set-up work is done, you can use the VPE Manager to add tool shops and view and modify their variables.

- 1 Open the VPE to which you want to add a tool shop.  
The VPE is displayed in the aPriori VPE Manager. For more information, , see *Opening a VPE* on page 9.
- 2 Expand the process group to which you want to add the tool shop.
- 3 Expand the **Processes** folder.
- 4 Expand the process folder to which you want to add the tool shop. (If your target process cannot be expanded or does not include a **Tool Shops** subfolder, review the preliminary work that was done on the CMWB as described above.)
- 5 Right-click **Tool Shops** and click **Create Tool Shop**.
- 6 Enter a name for the tool shop and click **OK**.  
The tool shop should now appear under the Tool Shops subfolder.
- 7 Click the new tool shop and enter values as needed in the fields that are displayed.

## Creating a new process

You can define a new process for a specific process group within a VPE:

- 1 From the **VPE Toolset**, click **Tools > Create New Process**.
- 2 In the resulting dialog, specify the VPE and the Process Group to which the process should be added. (This feature currently works for VPE Cost Models and not baseline cost models. For example, you can create a new process for an overlay VPE based on the aPriori USA baseline VPE, but you cannot add it directly to the aPriori USA baseline VPE.)

- 3 Enter a name for the process.
- 4 Optionally, you can specify if you wish to copy the machine table definition from another process to this new process.

**Note:** This copies only the table definition, not the actual table data.

- 5 Click **OK**.

For more details about using this feature, see the section "Adding a New Process to a Process Group" in the *Cost Model Workbench Guide*.

## Exporting, modifying, and importing processes

aPriori provides the ability to export and import processes, allowing you to develop and modify processes and then share them across different process groups or VPEs. The export and import procedures themselves are relatively straightforward and are covered in the following two sections:

- *To export processes* on page 20
- *To import processes* on page 39

However, there are a number of constraints and details that you should consider when exporting and importing processes. Import behavior may vary depending on a number of factors, such as the Cost Model Version (CMV) of the donor and recipient process groups, whether the donor or recipient have been overridden, whether or not you are working with overlays, etc.

### Constraints:

- This table shows the behavior of an import based on whether or not the "donor" and "recipient" objects (CSL files, field definitions, etc.) have been overridden:

Donor	Recipient	Result
Baseline	Baseline	Ignore
Baseline	Overridden	Ignore
Overridden	Baseline	Import
Overridden	Overridden	Import

- The CMV of the Process Group from which the process was exported must exist in the recipient VPE.
- Choosing to import over an existing item will replace anything existing in that item, so it is your responsibility to ensure that nothing is broken as a result.
- VPE data is not transferred to or from overlay VPEs.

However, you can work around this using the Export/Import VPE data tools (see *To export VPE Data to Excel* and *To Import VPE Data from Excel*):

- 1 Export processes from the donor process group,
- 2 Export all VPE data from the donor VPE.
- 3 Trim all data other than the relevant processes.
- 4 Import the process(es) to the recipient process group.
- 5 Import the trimmed VPE data to the recipient VPE.
  - When exporting from an Overlay, a process must live entirely in that level of the overlay. I.e., you cannot build an Investment Casting process in Level A, override just a single operation in Level B, and export from Level B.
  - Process export/import is a manual feature that does not provide a lot of automation or error checking. You must take responsibility to ensure that your work is complete and valid. Note that you must:
    - Manually perform any template creation, modification, or reconciliation operations. (Templates are not included in the export/import operations.)
    - Explicitly specify any associated branch nodes.
    - Ensure that the process will work with the CMV of the recipient VPE. For example, inherited items may be different if the exported process was built on CMV50 and is imported into CMV100: the import will simply respect inheritance, it will not verify that the inherited item has not changed from CMV to CMV.
    - You may occasionally encounter a situation with an older process where the export does not include all of the data required by the process. When you import the process to another process group, this missing data can lead to a costing error message. For example, the Sheet Metal "Std Press" process references a "Die Base Cost" value which was not included in the Std Press tool shop when the process was written. It was stored in a separate lookup table using a mechanism that has not been used for the more recently developed processes. When you import this process to another process group, you may get an error similar to `"Standard Press Tool Shop:Diemaker1 plant:TestVPEStdPress is invalid. Die Base Cost Table is empty in CSL module processes/Std Press/Component/csl/ptaxStdPress.csl at line 221 in CSL module processes"` While this is very rare, you must be prepared to perform some manual CSL and lookup table editing to work around the issue (or be willing to have aPriori Professional Services assist you).

## Editing VPE data

The aPriori VPE Manager supports several ways to edit VPE data. You can:

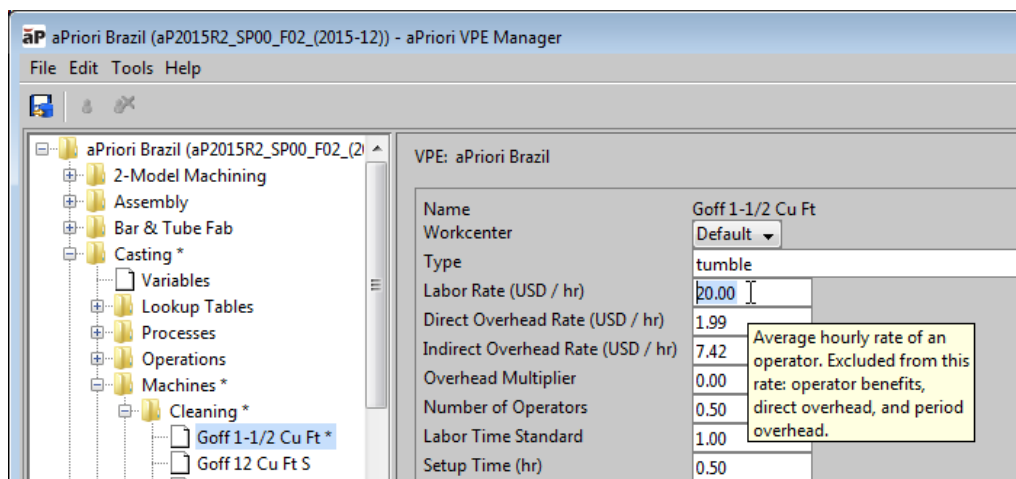
- Edit individual data fields. We recommend this approach if you need to make changes to a single item.


- Edit data within the cells of a table. We recommend this approach for batch changes because you can view all the machines or materials requiring a change in one table.
- Export the data within a single VPE machine or material folder to a .csv file, edit the data in Excel, then import the data back into the VPE. This approach is efficient if you are editing a single machine or material table.
- Export all the data in a VPE to a set of Excel spreadsheets, where you can edit the data and then re-import it. This is useful if you need to edit a large amount of data across multiple process groups.

**Note:** Do **NOT** edit the **Cost Model Version** without the support of aPriori Professional Services or aPriori Support. Editing the version changes the VPE's process and cost logic and may change the behavior of your specific VPE (that is, changing the cost model version can modify the VPE configurations and cost model extensions made by your organization).

## To edit individual data fields

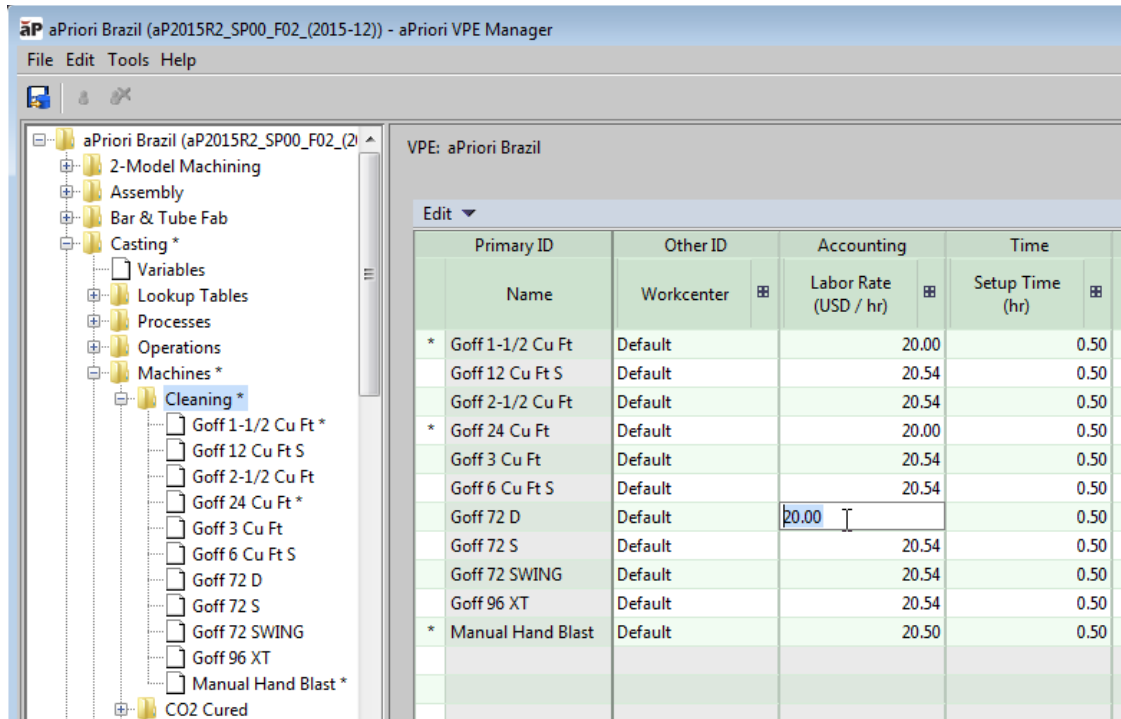
- 1 Navigate to the display of a single page of information.



- 2 Edit values as necessary within the data fields shown in the Data pane.  
As you edit, an asterisk (\*) appears next to the file in the Navigation pane and next to the row to indicate that there are unsaved changes.
- 3 Select **File > Publish VPE** from the VPE Manager menu bar or click  in the toolbar to save your changes.

## To edit data in tables




- 1 Navigate to the display of a table of information.




- 2 Double-click non-gray cells in the table displayed in the Data pane to edit the values in those cells.

As you edit, an asterisk (\*) appears next to the file in the Navigation pane and next to the row to indicate that there are unsaved changes.

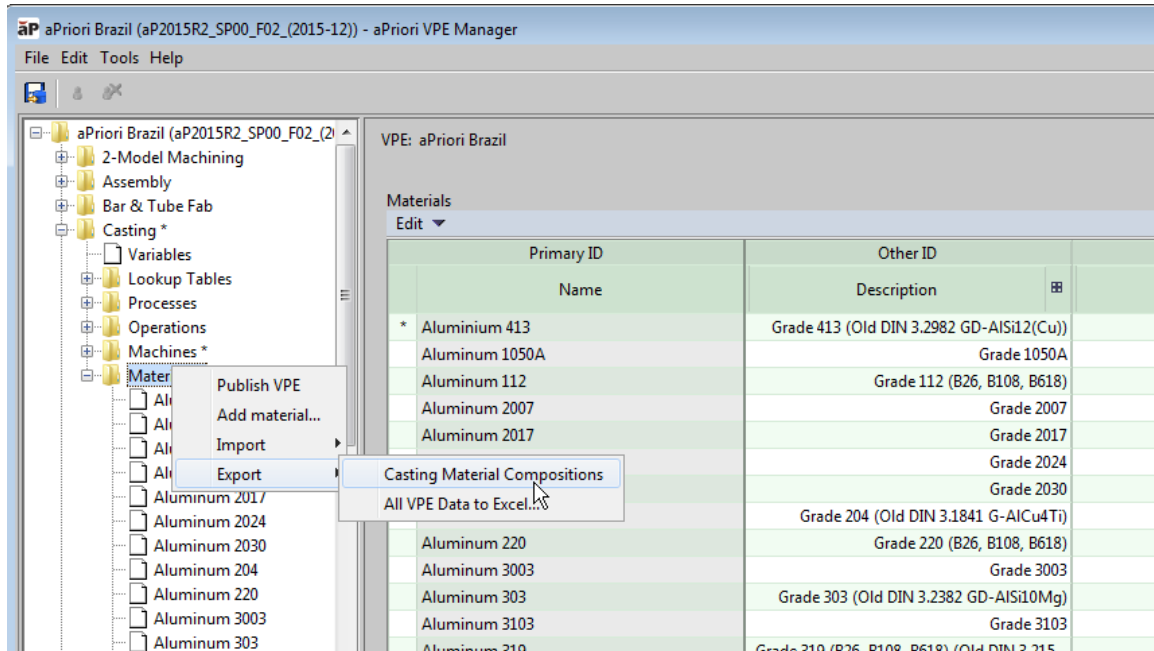
When editing data in a table, you can:

- Hover in the upper left corner of the table to display icons  that allow you to expand, collapse, and resize columns.
- Click  in the column header to expand the column and display its sub-columns. Click  to collapse the sub-columns.
- Click a column header to sort the table by that column. Click again to reverse the sort.

- 3 Select **File > Publish VPE** from the VPE Manager menu bar or click  in the toolbar to save your changes.

## To edit by exporting individual tables to .csv files


- 1 Navigate to a machine or materials table.



- 2 Right-click the folder in the Navigation pane and select **Export > <table\_name>** from the context menu.
- 3 In the resulting **Select a File to Export** window, navigate to the folder where you want to save the .csv file, specify a name, and click **Save**.
- 4 Open the exported .csv file in Microsoft Excel.
- 5 Edit the values in Excel.
 

The **Name** field in material and machine tables cannot be changed because it is the primary ID for the table. If you do edit this field, it will create a new machine, material type, or material stock and leave the original one as is when you import the data into the aPriori VPE Manager.

You must delete items from within the VPE Manager. They cannot be deleted in Excel. For more information, see *Deleting machine and material data from a VPE* on page 64.
- 6 Save the edited file as a .csv file in Excel.
- 7 Right-click the folder you selected in step 1 and select **Import** from the context menu to display the **Select File to Import** window.
- 8 Select the edited .csv file and click **Open** to update all the data within the folder with the edited data and display the details of the import in the **Import Summary** window.

- 9 Click **OK** to close the **Import Summary** window.
- 10 Select **File > Publish VPE** from the VPE Manager menu bar or click  in the toolbar to save your changes.

### To edit by exporting data to Excel


aPriori's powerful Excel export/import capabilities are covered in the following sections:

- *To export VPE Data to Excel*
- *To export VPE Lookup Tables to Excel*
- *To Import VPE Data from Excel*
- *To Import VPE Lookup Tables from Excel*

## Deleting machine and material data from a VPE

Delete machine and material data from a VPE when your facility does not have that machine or use that material. You can delete machine and material data from the Navigation pane or from the Data pane. If you need to delete multiple items, use the Data pane.

### To delete a machine, material type, or material stock from the Navigation pane

- 1 Right-click the machine, material type, or material stock you want to delete and select one of the following from the context menu to display the **Delete Material** window:
  - **Delete machine**
  - **Delete Material**
  - **Delete Material Stock**
- 2 Click **OK** to delete the machine, material type, or material stock.
- 3 Select **File > Publish VPE** from the VPE Manager menu bar or click  in the toolbar to save your changes.

### To delete a machine, material type, or material stock from the Data pane

- 1 Select one of the following in the Navigation pane:
  - Machine type folder
  - **Materials** folder
  - Material type folder
- 2 Right-click a row in the table in the Data pane and select **Delete Rows** from the context menu to delete the machine, material type, or material stock.

To delete multiple machines, material types, or material stocks, Ctrl+click each row that you want to delete, then right-click one of the selected rows and select **Delete Rows** from the context menu.

If you attempt to delete the machine currently specified as the default machine for a process, you must select a new default machine. If you do not select a default machine, no rows will be deleted.

## Removing tool shops from a VPE

- 1 From the VPE Manager, click **Tools > Remove Tool Shops**.
- 2 Follow the embedded “Key Usage Notes” to navigate through the VPE, process group, and available processes to find and select the tool shop you wish to remove.
- 3 Select **OK** when done.
- 4 **Publish** the modified VPE.

## Working with wage grades

Wage grades help you manage the labor rates associated with the various machines in a process group. If you assign the same wage grade to multiple machines, you can change the labor rate associated with those machines *all at once*, by changing the labor rate associated with the assigned wage grade. This means that instead of making a change to the **Labor Rate** field for every machine, you can make one change to the **Labor Rate** field of the assigned wage grade.

Working with wage grades involves working with the following types of tables:

- **Skill Levels:** each VPE has one Skill Levels table, which contains definitions of skill levels. Each wage grade associates a skill level and a process type (such as Metals or Plastics) with a labor rate. Each skill level is identified by a positive integer, and optionally has a name and description.

VPE: aPriori USA

Skill Levels  
Edit ▼

Skill Level	Name
1	Basic Skills, no training
2	Basic Skills, some on the job training
3	Intermediate Skills and job experience, limited vocational training
4	Intermediate Skills and job experience, standard vocational training
5	Advanced Skills and job experience, standard vocational training
6	Advanced Skills and job experience, specialized training and certification
7	Master Skills and job experience, advanced vocational training
8	Expert Skills and job experience, professional education
9	Expert Skills, high academic training, professional certification



Starting point VPEs include some predefined skill levels. You can use the Skill Levels table to edit, add, and delete skill levels. See [Managing skill levels](#).

- **Wage Grades:** each VPE has one Wage Grades table, which contains definitions of wage grades. Each wage grade is identified by a skill level and a process type (no two wage grades can have both the same skill level and the same process type). Each wage grade also has an associated labor rate, which you can change as needed.

VPE: aPriori USA

Wage Grades

Edit ▼

Skill Level	Labor Rate	Process Type	Wage Grade
-	0.00	Metal industry	0 - Metal industry
1	14.27	Metal industry	1 - Metal industry
2	22.50	Casting	2 - Casting
2	17.31	Metal industry	2 - Metal industry
2	16.45	Plastic industry	2 - Plastic industry
3	27.29	Casting	3 - Casting
3	20.99	Metal industry	3 - Metal industry
3	19.94	Plastic industry	3 - Plastic industry
4	32.48	Casting	4 - Casting
4	24.98	Metal industry	4 - Metal industry
4	23.73	Plastic industry	4 - Plastic industry
5	35.59	Casting	5 - Casting
5	27.38	Metal industry	5 - Metal industry
6	30.48	Metal industry	6 - Metal industry

Starting point VPEs include some predefined wage grades. You can use the Wage Grades table to modify, add, and delete wage grades. See [Managing wage grades](#).

- **Wage Grade Associations:** each process group has one Wage Grade Associations table, which associates machines with wage grades.

VPE: aPriori USA

Wage Grade Associations

Edit ▾

Process Name	Wage Grade Name
2 Axis Router	3 - Metal industry
2 Roll Bending	4 - Metal industry
3 Roll Bending	4 - Metal industry
3D Laser	3 - Metal industry
4 Roll Bending	4 - Metal industry
Bend Brake	3 - Metal industry
CTL	2 - Metal industry
Deslag	2 - Metal industry
Generic Press	3 - Metal industry
Laser Cut	3 - Metal industry
Laser Punch	3 - Metal industry
Material Stock	0 - Metal industry

Starting point VPEs have predefined wage grade associations that vary by process, but for machines within a process are always the same. You can use the Wage Grade Association table to modify these associations. You can also manage wage grade associations with the machine table for a process, or with the machine property **Wage Grade Name** for a specific machine. See [Managing wage grade associations](#).

You can generate a Wage Grades report by selecting **File > Export > Wage Grades**. This report is an Excel file with one row for each machine in the VPE, grouped by process group and process; it displays **Labor Rate**, **Skill Level**, and **Wage Grade** field values for each machine. When you are ready to update your VPEs to use wage grades rather than labor rates for individual machines, you can use this report to review the spectrum of labor rates assigned to different processes and machines within a given process. You can even convert the report to a pivot table using standard functionality in Microsoft Excel, to help analyze the data. This can help you to determine how many wage grades should be established, and which wage grade should be associated with each process or machine.

You also can use this report to determine if a machine has a labor rate or wage grade specified in its machine field or if it is inheriting a labor wage grade association specified at the process level. If the labor rate or wage grade is specified for an individual machine, the Labor Rate, Skill Level, and/or Wage Grade columns will be populated in the row for that machine. If the machine is inheriting its values from the wage grade association at the process level, those fields will be blank.

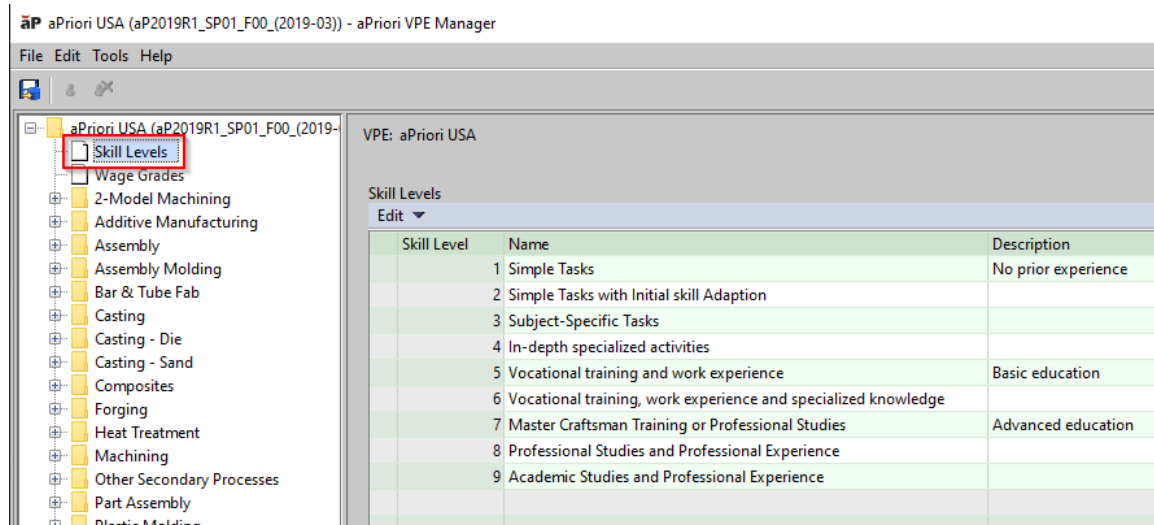
## Managing skill levels

You manage skill levels for a VPE with the Skill Levels table.

### To view the Skill Levels table

Click **Skill Levels** in the navigation pane of the VPE Manager.

The Skill Levels table appears:



Each row of the table defines a skill level.

### To edit a skill level

- 1 For each cell of the Skill Levels table that you want to edit, double click inside the cell, and modify the text.
- 2 When you are done editing the table, select **Publish VPE** from the **File** menu or click the Publish icon in the toolbar.

### To add a skill level

- 1 Right click a row of the Skill Levels table, and select **Add new Skill Level...**

The **New Skill Level** dialog appears:

The 'New Skill Level' dialog box contains three input fields: 'Skill Level:', 'Skill Name:', and 'Skill Description:'. At the bottom are 'OK' and 'Cancel' buttons.

- 2 Enter a positive integer in the **Skill Level** field. Do *not* enter a number that already appears in the **Skill Level** column of the table. Optionally, add text to the **Skill Name** and **Skill Description** fields.
- 3 Click **OK**. The new row appears in the table.

- 4 When you are done editing the table, select **Publish VPE** from the **File** menu or click the Publish icon in the toolbar.

#### **To delete a skill level**

- 1 Right click a row of the Skill Levels table and select **Delete Rows**.
- 2 When you are done editing the table, select **Publish VPE** from the **File** menu or click the Publish icon in the toolbar.

#### **To delete multiple skill levels**

- 1 Select multiple rows by clicking a row and ctrl-clicking additional rows. Alternatively, select a range of rows by clicking the row at the beginning of the range and shift-clicking the row at the end of the range.
- 2 Right click one of the selected rows and select **Delete Rows**.
- 3 When you are done editing the table, select **Publish VPE** from the **File** menu or click the Publish icon in the toolbar.

## **Managing wage grades**

You manage wage grades for a VPE with the Wage Grades table.

#### **To view the Wage Grades table**

Click **Wage Grades** in the navigation pane of the VPE Manager.

The Wage Grades table appears:

aP aPriori USA (aP2019R1\_SP01\_F00\_(2019-03)) - aPriori VPE Manager

File Edit Tools Help

Connected to:

aPriori USA (aP2019R1\_SP01\_F00\_(2019-03))

- Skill Levels
- Wage Grades**
- 2-Model Machining
- Additive Manufacturing
- Assembly
  - Variables
  - Wage Grade Associations
  - Lookup Tables
  - Processes
  - Operations
  - Machines
    - Adhesive Bonding
      - Manual Adhesive Bon
      - Robotic Adhesive Bon
    - Cap Sealing
    - Electron Beam Welding
    - Fay Sealing
    - Fillet Sealing
    - Laser Welding
    - Lock Bolt
    - Manual MIG Welding
    - Manual Spot Welding
    - Manual TIG Welding
    - Mechanical Assembly
    - Pick and Place
    - Rivet
    - Robotic MIG Welding
    - Robotic Spot Welding

VPE: aPriori USA

Wage Grades

Edit

Skill Level	Labor Rate	Process Type	Wage Grade
1	24.99	Metals	1 - Metals
1	26.00	Plastics	1 - Plastics
2	25.55	Metals	2 - Metals
2	27.02	Plastics	2 - Plastics
3	27.30	Metals	3 - Metals
3	28.00	Plastics	3 - Plastics
4	30.20	Metals	4 - Metals
4	33.10	Plastics	4 - Plastics
5	35.42	Metals	5 - Metals
5	37.31	Plastics	5 - Plastics
6	24.99	Metals	6 - Metals
6	26.00	Plastics	6 - Plastics
7	25.55	Metals	7 - Metals
7	27.02	Plastics	7 - Plastics
8	27.30	Metals	8 - Metals
8	28.00	Plastics	8 - Plastics
9	30.20	Metals	9 - Metals
9	33.10	Plastics	9 - Plastics

Each row of the table represents a wage grade.

## To edit a wage grade

- 1 For each cell of the Wage Grades table that you want to edit, double click inside the cell, and modify the text.

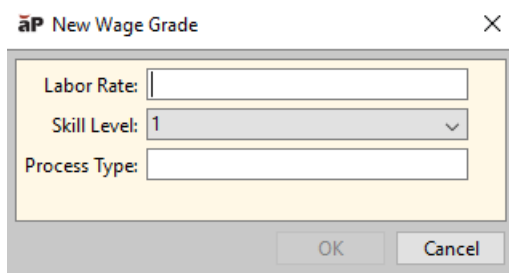
You can edit the **Labor Rate** and **Process Type** fields. You *cannot* edit the **Skill Level** and **Wage Grade** fields.

- 2 When you are done editing the table, select **Publish VPE** from the **File** menu or click the Publish icon in the toolbar.

## To add a wage grade

- 1 Right click a row of the Wage Grade table, and select **Add new Wage Grade...**

The **New Wage Garde** dialog appears:



The screenshot shows a dialog box titled "aP New Wage Grade" with a close button (X) in the top right corner. The dialog contains three input fields: "Labor Rate" (a text box), "Skill Level" (a dropdown menu with "1" selected), and "Process Type" (a text box). At the bottom of the dialog are "OK" and "Cancel" buttons.

- 2 Enter a non-negative integer in the **Labor Rate** field.
- 3 Click the **Skill Level** field and select a skill level.
- 4 Optionally, enter a process type in the **Process Type** field.
- 5 Ensure that no other wage grade has the same values matches the contents of both the **Skill Level** field and **Process Type** field.
- 6 Click **OK**. The new row appears in the table.
- 7 When you are done editing the table, select **Publish VPE** from the **File** menu or click the Publish icon in the toolbar.

### To delete a wage grade

- 1 Right click a row of the Wage Grades table and select **Delete Rows**.
- 2 When you are done editing the table, select **Publish VPE** from the **File** menu or click the Publish icon in the toolbar.

### To delete multiple wage grades

- 1 Select multiple rows by clicking a row and ctrl-clicking additional rows. Alternatively, select a range of rows by clicking the row at the beginning of the range and shift-clicking the row at the end of the range.
- 2 Right click one of the selected rows and select **Delete Rows**.
- 3 When you are done editing the table, select **Publish VPE** from the **File** menu or click the Publish icon in the toolbar.

## Managing wage grade associations

You manage wage grade associations for a process group with the Wage Grade Associations table. The table allows you to assign a wage grade to a process (and thereby assign that wage grade to all the machines for the process) or assign a wage grade to an individual machine.

Alternatively, you manage wage grade associations with the machine table for a process or with the **Wage Grade Name** machine property for an individual machine.

## To view the Wage Grade Associations table

In the navigation pane of the VPE Manager, expand the process group whose table you want to view, and click **Wage Grade Associations**.

The process group's Wage Grade Associations table appears:

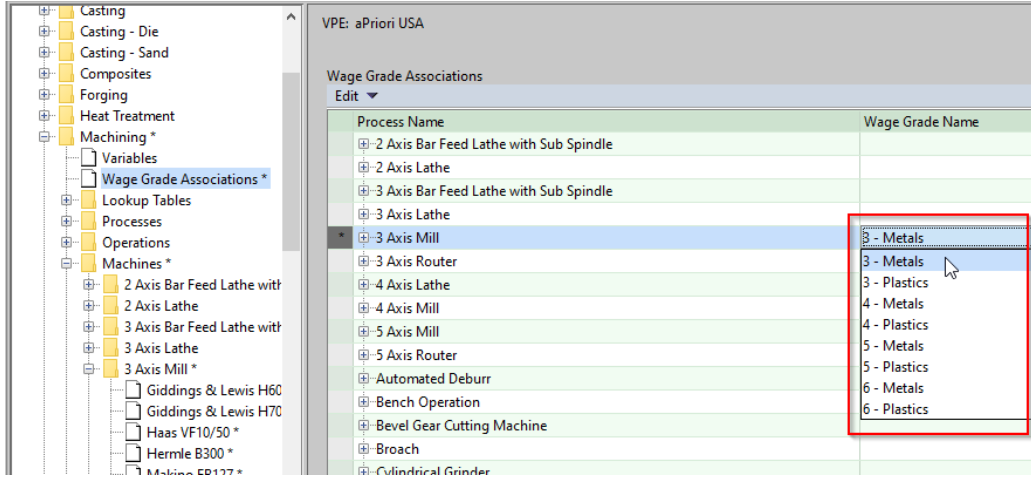
aP aPriori USA (aP2019R1\_SP01\_F00\_(2019-03)) - aPriori VPE Manager

File Edit Tools Help

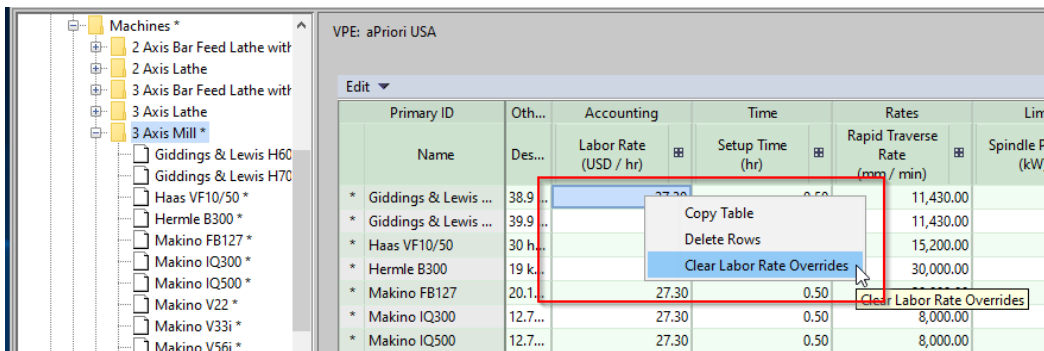
Process Name	Wage Grade Name
2 Axis Bar Feed Lathe with Sub Spindle	
2 Axis Lathe	
3 Axis Bar Feed Lathe with Sub Spindle	
3 Axis Lathe	
* 3 Axis Mill	3 - Metals
* Giddings & Lewis H60F	
* Giddings & Lewis H70F	
Haas VF10/50	
Hermle B300	
Makino FB127	
Makino IQ300	
Makino IQ500	
Makino V22	
Makino V33i	
Makino V56i	

## To assign a wage grade to a process

- 1 In the Wage Grade Associations table, select the process to which you want to assign a wage grade. Assigning a wage grade to a process effectively assigns
- 2 Double click the cell in the **Wage Grade Name** column for the selected row and select the desired wage grade from the dropdown menu.



- 3 In the machine table for the selected process, right click anywhere in the **Labor Rate** column, and select **Clear Labor Rate Overrides**.



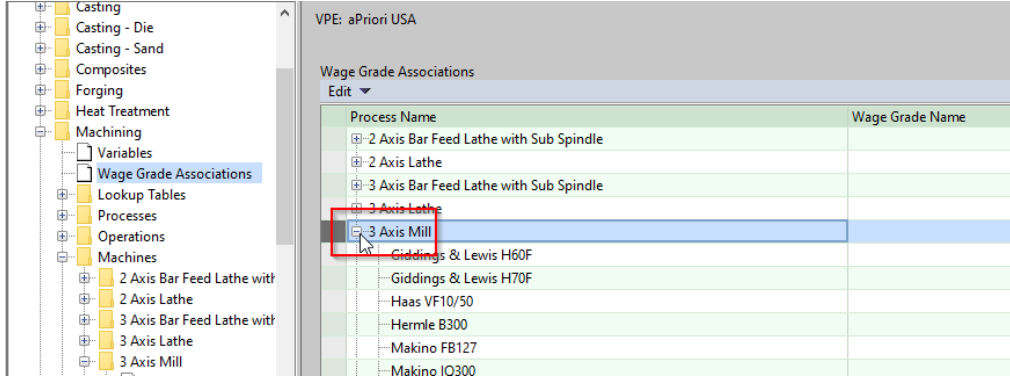
- 4 Click **OK** in the Clear Labor Rates Overrides dialog. aPriori updates the **Labor Rate** field for every machine of the selected process.
- 5 When you are done editing the table, select **Publish VPE** from the **File** menu or click the Publish icon in the toolbar.

### To assign a wage grade to a machine

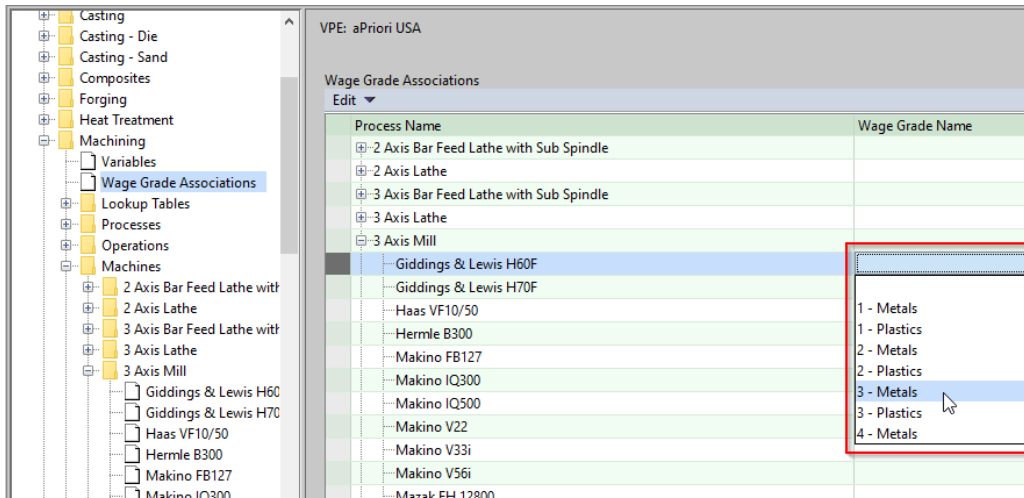
Note that this is only necessary if you want a machine to have a different wage grade from the one established for the Process.

- 1 In the **Process Name** column of the Wage Grade Associations table, expand the process for the machine to which you want to assign a wage grade.

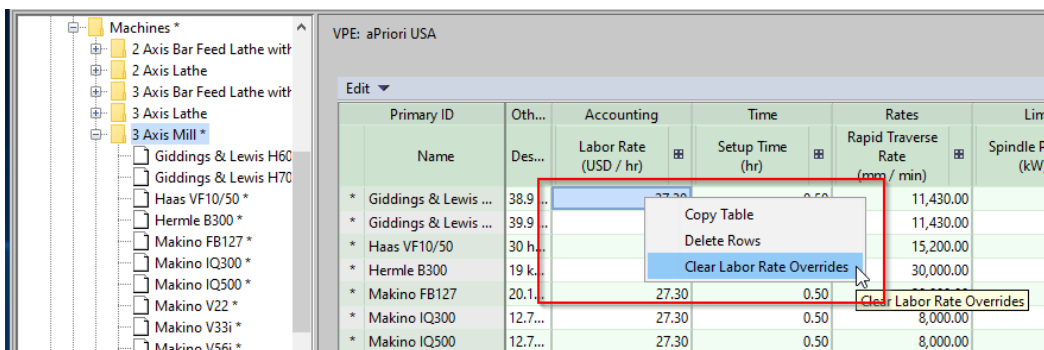




- 2 Select the machine to which you want to assign a wage grade.
- 3 Double click the cell in the **Wage Grade Name** column for the selected row and select the desired wage grade from the dropdown menu.



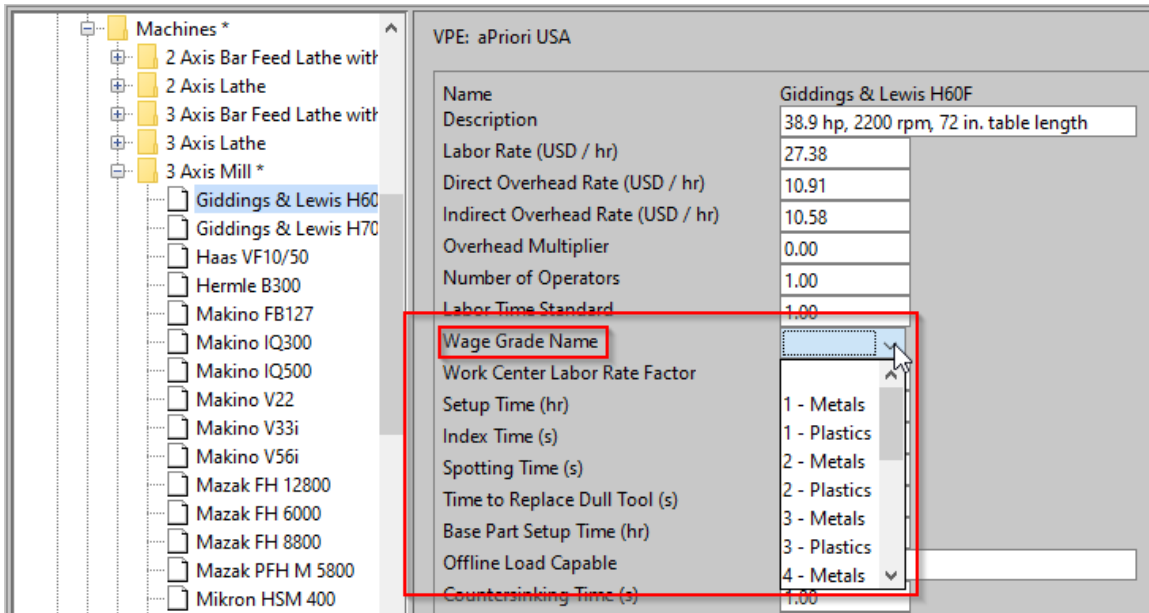
- 4 When you are done assigning wage grades to machines of the process, right click anywhere in the **Labor Rate** column of the process's machine table, select **Clear Labor Rate Overrides**.



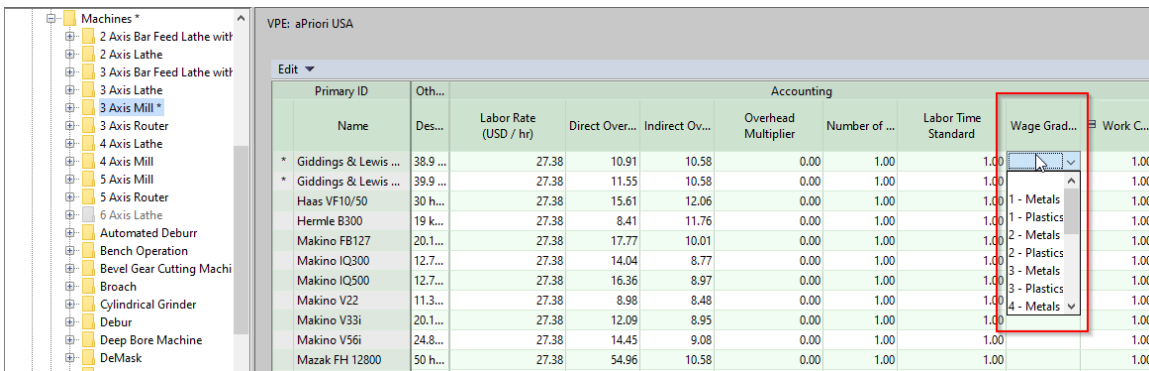
- 5 Click **OK** in the Clear Labor Rates Overrides dialog. aPriori updates the **Labor Rate** field for every machine to which you assigned a wage grade.

- When you are done editing the table, select **Publish VPE** from the **File** menu or click the Publish icon in the toolbar.

Note that you can also assign a wage grade to a machine by selecting the machine in the navigation pane and editing the machine's **Wage Grade Name** field.



You can also assign a wage grade to a machine by editing the machine's **Wage Grade Name** field in the machine table for the machine's process group.



In either case, aPriori updates the **Labor Rate** field once you have cleared Labor Rate overrides. (Note that is only necessary to **Clear Labor Rate Overrides** once per machine table.)

## Managing VPE cut code data

This section describes how to assign cut codes or add user-defined cut codes and provides several tables of reference data.

## Assigning material cut codes

aPriori requires that each material be assigned a cut code when it is added to a VPE. A material's cut code characterizes the machinability of a material and is adapted from the Sandvik Cormorant cutability classification (CMC code) scheme for metals. Different materials that machine similarly are assigned the same cut code. For example, both Inconel and Hastelloy are assigned a cut code of 20.21, as they are both nickel-based, heat resistant super-alloys.

aPriori uses the cut code to determine the appropriate cutting speed and feed rates for various machining operations, which affects the resulting machining process cycle time, and therefore, the cost of the part.

In some cases, you may want to assign a user-defined cut code instead of a CMC code. Consider, for example, two materials that are assigned the same CMC code, and suppose that you want aPriori to use different cutting speeds or feed rates for each one. In this case, you can assign one of the materials a user-defined cut code and enter custom speed and feed data for that cut code into the appropriate lookup table. See *Adding a user-defined cut code* on page 77.

If you are not familiar with the Sandvik Cormorant CMC code scheme, you can use this section to help you determine the appropriate cut code for a given material. This section contains the following tables:

- Cut codes reference listing for metals – Defined by Sandvik Coromant for metals
- Cut codes reference listing for plastics – Because Sandvik Coromant does not define cut codes for plastics, aPriori assigns unique cut code values using a similar numbering system
- Cut code by metallurgical category – If you know the metallurgical category, match it to a range of cut codes, and then further refine the cut code by using the Cut codes by example material and Brinell Hardness values table
- Cut codes by example metal material and Brinell Hardness value – If you know the material type and hardness, you can find a similar example material in this table to determine the cut code. Examples listed are for U.S. standards (AISI/SAE). You can find similar tables in other guides for Great Britain, Sweden, Germany, France, Italy, Spain, and Japan.
- Cut codes by example plastic material – If you know the plastic material type, you can find a similar example material in this table to determine the cut code.
- Cut codes by material trade name – If you know the trade name of the material, you may find it in this table, although it contains only a small fraction of existing trade names.
- Cut codes with recommended feeds and speeds – Recommended speed and feed data for both carbide and high-speed steel tools (for drilling with a 1.0” diameter tool). If you know the speed and feed for a material, you can find the corresponding cut code in this table. (aPriori allows you to override the feed and speed for most machining operations if only speed or feed matches the known value.)

- Cut codes with recommended feeds and speeds, relative to mild steel – Recommended speed and feed ratios relative to unalloyed low carbon steel (cut code 1.1). If you know the feed and speed for the material relative to mild steel, you can find the corresponding cut code in this table.

The data in the tables comes from the following sources:

- Machining Data Handbook, Vol. 1, 3<sup>rd</sup> Edition
- Machining Data Handbook, Vol. 2, 3<sup>rd</sup> Edition
- Sandvik Coromant (Metric) Rotating Tools, 2002
- Sandvik Coromant (Metric) Turning Tools, 2002

## Adding a user-defined cut code

Follow these steps to add a new, user-defined cut code and assign it to a material type:

- 1 Create a new material type and its stocks (see *Adding machine and material data* on page 51). If the material type already exists in aPriori (but with a CMC code instead of a user-defined cut code), delete it (see *Deleting machine and material data from a VPE* on page 64) and create a new material type with a user-defined cut code. When you create the material type, specify a cut code that is between 90.01 and 90.99 (inclusive).
- 2 Use Excel to create rows of cutting data for the new cut code. The cutting data for milling (in the lookup table **tblMilling**), for example, includes a row for each unique combination of cut code, tool series, and tool diameter; and each such row includes data for cutting speed, number of tool teeth, feed per tooth, tool life, and tool cost, among others.
- 3 Add the rows to the appropriate lookup table (for example, to **tblMilling**). See *Editing VPE data* on page 60.
- 4 If you subsequently add a new material type with the same associated cutting practices, you can assign it the same user-defined cut code. You do not need to re-enter the cutting data.

## Cut code reference listing for metals

Cut code	Description
1.0	Steel: Unalloyed, C = 0.05 - 0.10%
1.1	Steel: Unalloyed, C = 0.10 - 0.25%
1.2	Steel: Unalloyed, C = 0.25 - 0.55%
1.3	Steel: Unalloyed, C = 0.55 - 0.80%
1.4	Steel: Unalloyed, high carbon & carbon tool steel
1.5	Steel: Unalloyed, hardened and tempered
2.1	Steel: Low-alloyed, non-hardened
2.12	Steel: Low-alloyed, ball bearing steel
2.2	Steel: Low-alloyed, hardened and tempered

Cut code	Description
3.1	Steel: High-alloyed, annealed
3.11	Steel: High-alloyed, annealed
3.13	Steel: High-alloyed, hardened tool steel
3.2	Steel: High-alloyed, hardened
3.21	Steel: High-alloyed, hardened tool steel
3.22	Steel: High alloyed, hardened steel; others
4.0	Hard Steel: Hardened steel
4.1	Extra Hard Steel, hardened and tempered
5.1	Stainless Steel - bars/forged: Ferritic/martensitic
5.11	Stainless Steel - bars/forged: Ferritic/martensitic, non-hardened
5.12	Stainless Steel - bars/forged: Ferritic/martensitic, PH-hardened
5.13	Stainless Steel - bars/forged: Ferritic/martensitic, hardened
5.2	Stainless Steel - bars/forged: Austenitic
5.21	Stainless Steel - bars/forged: Austenitic, non-hardened
5.22	Stainless Steel - bars/forged: Austenitic, PH-hardened
5.23	Stainless Steel - bars/forged: Austenitic, super austenitic
5.51	Stainless Steel - bars/forged: Austenitic-ferritic (Duplex), non-weldable > 0.05%C
5.52	Stainless Steel - bars/forged: Austenitic-ferritic (Duplex), weldable < 0.05%C
6.1	Steel Castings: Unalloyed
6.2	Steel Castings: Low alloy (alloying elements < 5%)
6.3	Steel Castings: High alloy (alloying elements > 5%)
6.32	Castings: Stainless austenitic
6.33	Castings: Manganese steel, 12-14%
7.1	Malleable Cast Iron: Ferritic (short chipping)
7.2	Malleable Cast Iron: Pearlitic (long chipping)
7.3	Malleable Cast Iron: Martensitic
8.1	Grey Cast Iron: Low tensile strength
8.2	Grey Cast Iron: High tensile strength
8.3	Grey Cast Iron: Austenitic
9.1	Nodular SG Iron: Ferritic
9.2	Nodular SG Iron: Pearlitic
9.3	Nodular SG Iron: Martensitic
10.0	Chilled Cast Iron
10.1	Chilled Cast Iron: Cast or cast and aged
15.11	Stainless Steel - cast: Ferritic/martensitic, non-hardened
15.12	Stainless Steel - cast: Ferritic/martensitic, PH-hardened
15.13	Stainless Steel - cast: Ferritic/martensitic, hardened
15.21	Stainless Steel - cast: Austenitic
15.22	Stainless Steel - cast: Austenitic, PH-hardened
15.23	Stainless Steel - cast: Austenitic, super austenitic
15.51	Stainless Steel - cast: Austenitic-ferritic (Duplex), non-weldable > 0.05%C
15.52	Stainless Steel - cast: Austenitic-ferritic (Duplex), weldable < 0.05%C

Cut code	Description
20.11	Heat Resistant Super Alloys: Iron base, annealed or solution treated
20.12	Heat Resistant Super Alloys: Iron base, aged or solution treated and aged
20.2	Obsolete
20.21	Heat Resistant Super Alloys: Nickel base, annealed or solution treated
20.22	Heat Resistant Super Alloys: Nickel base, aged or solution treated and aged
20.23	Heat Resistant Super Alloys: Nickel base, cold drawn
20.24	Heat Resistant Super Alloys: Nickel base, cast or cast and aged
20.25	Obsolete
20.26	Obsolete
20.27	Obsolete
20.28	Obsolete
20.3	Obsolete
20.31	Heat Resistant Super Alloys: Cobalt base, annealed or solution treated
20.32	Heat Resistant Super Alloys: Cobalt base, aged or solution treated and aged
20.33	Heat Resistant Super Alloys: Cobalt base, cast or cast and aged
23.1	Heat Resistant Super Alloys: Titanium alloys, commercial pure (99.5% Ti)
23.21	Heat Resistant Super Alloys: Titanium alloys, a, near a and a + b alloys, annealed
23.22	Heat Resistant Super Alloys: Titanium alloys, a + b alloys in aged condition, b alloys, annealed
30.11	Aluminum Alloys: Wrought or wrought and coldworked, non-aging
30.12	Aluminum Alloys: Wrought or wrought and aged
30.21	Aluminum Alloys: Cast, non-aging
30.22	Aluminum Alloys: Cast or cast and aged
30.3	Aluminum Alloys: Al > 99%
30.41	Aluminum Alloys: Cast, 13 - 15% Si
30.42	Aluminum Alloys: Cast, 16 - 22% Si
33.1	Copper and Copper Alloys: Free cutting alloys, > 1% Pb
33.2	Copper and Copper Alloys: Brass, leaded bronzes, < 1% Pb
33.3	Copper and Copper Alloys: Bronze and non-leaded copper including electrolytic copper

## Cut code reference listing for plastics

Cut code	Description
41.11	Glass Filled Thermoplastic, Low Speed
41.21	Glass Filled Thermoplastic, Medium Speed
42.11	Glass Filled Thermoset, Low Speed
42.12	Glass Filled Thermoset, Low Speed
42.13	Glass Filled Thermoset, Low Speed
51.21	Unfilled Thermoplastic, Medium Speed

51.22	Unfilled Thermoplastic, Medium Speed
51.31	Unfilled Thermoplastic, High Speed
51.32	Unfilled Thermoplastic, High Speed
52.11	Unfilled Thermoset, Low Speed
52.12	Unfilled Thermoset, Low Speed
52.13	Unfilled Thermoset, Low Speed
52.14	Unfilled Thermoset, Low Speed
52.15	Unfilled Thermoset, Low Speed
52.21	Unfilled Thermoset, Medium Speed
52.31	Unfilled Thermoset, High Speed
52.32	Unfilled Thermoset, High Speed

### Cut codes by metallurgical category

Metallurgical category	Cut code
Carbon Steels, Wrought - Low Carbon	1.0
Carbon Steels, Wrought - Low Carbon	1.1
Carbon Steels, Wrought - Medium Carbon	1.2
Carbon Steels, Wrought - Medium Carbon	1.3
Carbon Steels, Wrought - High Carbon	1.4
Carbon Steels, Wrought - Medium Carbon	1.5
Free Machining Alloy Steels, Wrought - Medium and High Carbon Leaded	2.1
Free Machining Alloy Steels, Wrought - Medium and High Carbon Leaded	2.12
Free Machining Alloy Steels, Wrought - Medium and High Carbon Leaded	2.2
Tool Steels, Wrought - Hot Work	3.1
Tool Steels, Wrought - Hot Work	3.11
Tool Steels, Wrought - High Speed	3.13
Tool Steels, Wrought - Hot Work	3.2
Tool Steels, Wrought - Hot Work	3.21
Tool Steels, Wrought - Hot Work	3.22
Stainless Steels, Wrought - Martensitic	4.0
Stainless Steels, Wrought - Martensitic	4.1
Stainless Steels, Wrought - Martensitic	5.1
Stainless Steels, Wrought - Martensitic	5.11
Precipitation Hardening Stainless Steels, Wrought	5.12
Stainless Steels, Wrought - Martensitic	5.13
Stainless Steels, Wrought - Austenitic	5.2
Stainless Steels, Wrought - Austenitic	5.21
Precipitation Hardening Stainless Steels, Wrought	5.22
Stainless Steels, Wrought - Austenitic	5.23
Stainless Steels, Wrought - Ferritic	5.51
Stainless Steels, Wrought - Ferritic	5.52
Carbon Steels, Cast - Low Carbon	6.1
Alloy Steels, Cast - Low Carbon	6.2



<b>Metallurgical category</b>	<b>Cut code</b>
Alloy Steels, Cast - Low Carbon	6.3
Stainless Steels, Cast - Austenitic	6.32
Manganese, Wrought	6.33
Malleable Cast Irons	7.1
Malleable Cast Irons	7.2
Malleable Cast Irons	7.3
Gray Cast Irons - Pearlitic - Ferritic	8.1
Gray Cast Irons - Pearlitic + Free Carbide	8.2
Gray Cast Irons - Austenitic (Ni - Resist)	8.3
Ductile Cast Irons - Ferritic	9.1
Ductile Cast Irons - Pearlitic-Martensitic	9.2
Ductile Cast Irons - Martensitic	9.3
White Cast Irons (Abrasion Resistant) - Annealed	10.0
White Cast Irons (Abrasion Resistant) - Annealed	10.1
Stainless Steels, Cast - Martensitic	15.11
Precipitation Hardening Stainless Steels, Cast	15.12
Precipitation Hardening Stainless Steels, Cast	15.13
Stainless Steels, Cast - Austenitic	15.21
Precipitation Hardening Stainless Steels, Cast	15.22
Stainless Steels, Cast - Austenitic	15.23
Stainless Steels, Cast - Ferritic	15.51
Stainless Steels, Cast - Ferritic	15.52
High Temperature Alloys, Wrought and Cast - Iron Base, Wrought	20.11
High Temperature Alloys, Wrought and Cast - Iron Base, Wrought	20.12
High Temperature Alloys, Wrought and Cast - Nickel Base, Wrought	20.21
High Temperature Alloys, Wrought and Cast - Nickel Base, Wrought	20.22
High Temperature Alloys, Wrought and Cast - Nickel Base, Wrought	20.23
High Temperature Alloys, Wrought and Cast - Nickel Base, Cast	20.24
High Temperature Alloys, Wrought and Cast - Cobalt Base, Wrought	20.31
High Temperature Alloys, Wrought and Cast - Cobalt Base, Wrought	20.32
High Temperature Alloys, Wrought and Cast - Cobalt Base, Cast	20.33
Titanium Alloys, Wrought - Commercially Pure	23.1
Titanium Alloys, Wrought - Alpha and Alpha-Beta Alloys	23.21
Titanium Alloys, Wrought - Alpha and Alpha-Beta Alloys	23.22
Aluminum Alloys, Wrought	30.11
Aluminum Alloys, Wrought	30.12
Aluminum Alloys, Cast - Die Castings	30.21
Aluminum Alloys, Cast - Die Castings	30.22
Aluminum Alloys, Cast - Die Castings	30.3
Aluminum Alloys, Cast - Sand and Permanent Mold	30.41
Aluminum Alloys, Cast - Die Castings	30.42
Copper Alloys, Cast	33.1
Copper Alloys, Cast	33.2
Copper Alloys, Cast	33.3
Plastics, Thermoplastics - Filled and Molded	41.11



Metallurgical category	Cut code
Plastics, Thermoplastics - Filled and Molded	41.21
Plastics, Thermosetting Plastics - Filled and Molded	42.11
Plastics, Thermosetting Plastics - Filled and Molded	42.12
Plastics, Thermosetting Plastics - Filled and Molded	42.13
Plastics, Thermoplastics - Cast, Molded, or Extruded	51.21
Plastics, Thermoplastics - Molded or Extruded	51.22
Plastics, Thermoplastics - Cast, Molded, or Extruded	51.31
Plastics, Thermoplastics - Molded or Extruded	51.32
Plastics, Thermosetting Plastics - Cast or Molded	52.11
Plastics, Thermosetting Plastics - Cast	52.12
Plastics, Thermosetting Plastics – Cast	52.13
Plastics, Thermosetting Plastics - Filled and Molded	52.14
Plastics, Thermosetting Plastics - Cast	52.15
Plastics, Thermosetting Plastics - Cast	52.21
Plastics, Thermosetting Plastics - Cast or Molded	52.31
Plastics, Thermosetting Plastics - Molded or Extruded	52.32

## Cut codes by example metal material and Brinell Hardness values

Example metal materials	Hardness	Cut code
U.S. - 1005, 1006, 1008, 1009, 1010, 1012, 1015, 1017, 1020, 1023, 1025	125 HB	1.0
U.S - 1005, 1006, 1008, 1009, 1010, 1012, 1015, 1017, 1020, 1023, 1025, A570.36, 1115, A573-81 65, 1015, 1020, 1213, 12L13, 1215, 12L14, 1025, A572-60 DIN - 17100, 1.0144 CR, 1.0144 HR, 1.0402 CR, 1.0402 HR, 1.1121 CR, 1.1121 HR, 10025-5 CR, 10142 HR, 10273 HR, 1626 HR, 1652-3 CR, 1652-3 HR, 17100 HR, 17103 CR, 59231 HR EN - 10210-1, 10025-2 CR, 10025-2 HR, 10083-2 CR, 10083-2 HR, 10132-2 CR, 10132-2 HR, 10017 CR, 10277-2 HR, 10060 HR, 10210 HR, 10084 CR, 10278 HR, 10210-1 HR, 10250-2 CR, 10025/2-2004 HR	125 HB	1.1
U.S - 1005, 1006, 1008, 1009, 1010, 1012, 1015, 1017, 1020, 1023, 1025, A570.36, 1115, A573-81 65, 1015, 1020, 1213, 12L13, 1215, 12L14, 1025, A572-60, 59231 HR, 10142 HR, 1626 HR, 1652-3 CR, 10025-5 CR, 1652-4 CR, 1652-3 HR, 10273 HR, 1652-4 HR, 17100 HR, 10025/2-2004 HR, 10277-2 HR, 10210 HR, 10278 CR, 10017 CR, 10025-2 CR, 10278 HR, 10060 HR, 10083-2 HR, 10210-1 HR, 1652-3 CR, 17103 CR, 1652-4 CR, 10084 CR, 10250-2 CR, 10025-2 CR, 59231 HR, 10142 HR, 1626 HR, 1.1121 CR, 1.0144 CR, 1.0402 CR, 1.1121 HR, 1.0144 HR, 1.0402 HR, 10025/2-	150 HB	1.2

Example metal materials	Hardness	Cut code
2004 HR, 10277-2 HR, 10210 HR, 10132-2 CR, 10025-2 CR, 10083-2 CR, 10132-2 HR, 10025-2 HR, 10083-2 HR		
U.S. - 1030, 1033, 1035, 1037, 1038, 1039, 1040, 1042, 1043, 1044, 1045, 1046, 1049, 1050, 1053, 1055, 1525, 1526, 1527, 1060	170 HB	1.3
U.S. - 1060, 1064, 1065, 1069, 1070, 1074, 1075, 1078, 1080, 1084, 1085, 1086, 1090, 1095, 1561, 1566, 1572, 1095, W1, W210	210 HB	1.4
U.S. - 1524, 1536, 1541, 1547, 1548, 1551, 1552	300 HB	1.5
U.S. - 41L30, 41L40, 41L45, 41L47, 41L50, 43L40, 51L32, 52L100, 86L20, 86L40, A573-81, 5120, 9255, 9262, 52100, ASTM A204Gr.A, 4520, ASTM A350LF5, 8620, 8740, 5015, 5140, 5155, ASTM A182, F11, F12, F22, L1, 8620, L6	180 HB	2.1
U.S. - 41L30, 41L40, 41L45, 41L47, 41L50, 43L40, 51L32, 52L100, 86L20, 86L40	210 HB	2.12
U.S. - 41L30, 41L40, 41L45, 41L47, 41L50, 43L40, 51L32, 52L100, 86L20, 86L40, 3135, 3415, 3310, 9255, 4130	330 HB	2.2
U.S. - H10, H11, H12, H13, H14, H19	200 HB	3.1
U.S. - H10, H11, H12, H13, H14, H19, ASTM A353, 2515, D3, H13, A2, S1, H21, HW3	200 HB	3.11
U.S. - M1, M2, M6, M10, T1, T2, T6, M 2, M 35, M 7	200 HB	3.13
U.S. - H10, H11, H12, H13, H14, H19	225 HB	3.2
U.S. - H10, H11, H12, H13, H14, H19, HNV3	300 HB	3.21
U.S. - H10, H11, H12, H13, H14, H19	380 HB	3.22
U.S. - 440A, 440B, 440C	55 HRc	4.0
U.S. - 440A, 440B, 440C, 610, 0-2	59 HRc	4.1
U.S. - 403, 410, 420, 422, 501, 502	200 HB	5.1
U.S. - 403, 410, 420, 422, 501, 502, 403, 416, 430, 410, 405, 420, 431, 431F, 434, CA6-NM, 405, HNV6, 446, EV8, S44400	200 HB	5.11
U.S. - 15-5 PH, 16-6 PH, 17-4 PH, 17-7 PH, 17-14 Cu Mo, AF-71, AFC-77, Almar 362 (AM-362), AM-350, AM-355, AM-363, Custom 450, Custom 455, HNM, PH 13-8 Mo, PH 14-8 Mo, PH 15-7 Mo, Stainless W, 630, 17-4 PH	330 HB	5.12
U.S. - 403, 410, 420, 422, 501, 502	330 HB	5.13
U.S. - 201, 202, 301, 302, 304, 304L, 305, 308, 321, 347, 348, 384, 385, 302B, 309, 309S, 310, 310S, 314, 316, 316L, 317, 330	175 HB	5.2
U.S. - 201, 202, 301, 302, 304, 304L, 305, 308, 321, 347, 348, 384, 385, 302B, 309, 309S, 310, 310S, 314, 316, 316L, 317, 330, 304L, 304, 303, 301, 304LN 316, 316LN, 316L, 317L, UNS V 0890A, 321, 347, 316 Ti, 318, 309, 310S, 308, 4133, 2528, 17456, 10272, 10088-3, 10216-5, 17440, 1.4305, 1.4305, 1.4301, 1.4401, 1.4436, 58M, 10088-1,	200 HB	5.21

Example metal materials	Hardness	Cut code
10222-5, 10269, 1.4301, 17441, 1.4404, 10028-7, 10088-7, 10088-2, 1.4301, 17441, 1.4404, 10028-7, 10088-7, 10088-2 DIN - 1.4301, 1.4305, 1.4401, 1.4404, 1.4436, 2528, 4133, 17440, 17441, 17456 EN - 10028-7, 58M, 10222-5, 10088-2, 10269, 10088-3, 10272, 1.4305, 10088-7, 10216-5		
U.S. - 15-5 PH, 16-6 PH, 17-4 PH, 17-7 PH, 17-14 Cu Mo, AF-71, AFC-77, Almar 362 (AM-362), AM-350, AM-355, AM-363, Custom 450, Custom 455, HNM, PH 13-8 Mo, PH 14-8 Mo, PH 15-7 Mo, Stainless W	330 HB	5.22
U.S. - Nitronic 32, Nitronic 33, Nitronic 40, Nitronic 50, Nitronic 60, NO8028, S31254	200 HB	5.23
U.S. - 405, 409, 429, 430, 434, 436, 442, 446, S31500, S32900	230 HB	5.51
U.S. - 405, 409, 429, 430, 434, 436, 442, 446, S32304, S31803	260 HB	5.52
U.S. - ASTM A426: Grade CP1; 1010, 1020 DIN - 1681 GS52 EN - 10293	150 HB	6.1
U.S. - ASTM A217: Grade WC9; ASTM A352: Grades LC3, LC4; ASTM A426: Grades CP2, CP5, CP5b, CP11, CP12, CP15, CP21, CP22; 1320, 2315, 2320, 4110, 4120, 4320, 8020, 8620	200 HB	6.2
U.S. - ASTM A217: Grade WC9; ASTM A352: Grades LC3, LC4; ASTM A426: Grades CP2, CP5, CP5b, CP11, CP12, CP15, CP21, CP22; 1320, 2315, 2320, 4110, 4120, 4320, 8020, 8620 DIN - 17155 EN - 10213	200 HB	6.3
U.S. - ASTM A297: Grades HD, HE, HF, HH, HI, HK, HL, HN, HP, HT, HU; ASTM A608: Grades HD50, HE35, HF30, HH30, HH33, HI35, HK30, HK40, HL30, HL40, HN40, HT50, HU50	200 HB	6.32
-	250 HB	6.33
U.S. - ASTM A47: Grades 32510, 35018; ASTM A602: Grade M3210; SAE J158: Grade M3210, L3	130 HB	7.1
U.S. - ASTM A220: Grades 40010, 45006, 45008, 50005; ASTM A602: Grade M4504, M5003; SAE J158: Grades M4504, M5003, 32510 DIN - 1693 GGG-40 EN - GJS-400	230 HB	7.2
U.S. - ASTM A220: Grade 80002; ASTM A602: Grade M8501; SAE J158: Grade M8501, 40010, 50005, 70003, A220-70003	250 HB	7.3

Example metal materials	Hardness	Cut code
U.S. - ASTM A48: Class 25; SAE J431c: Grade G2500, A220-80002 DIN - 1691 GG, 1561 GG-10 EN - GJL-100, 1561	180 HB	8.1
U.S. - ASTM A48: Classes 45, 50; SAE J431c: Grades G3500, G4000, No 20 B, No 25 B, No 30 B	220 HB	8.2
U.S. - ASTM A436: Types 2, 3, 6; ASTM A436: Types 2b, 4, No 35 B, No 40 B, No 45 B, No 50 B, No 55 B	175 HB	8.3
U.S. - ASTM A536: Grades 60-40-18, 65-45-12; SAE J434c: Grades D4018, D4512, A436 Type 2	160 HB	9.1
U.S. - ASTM A536: Grade 100-70-03; SAE J434c: Grade D7003, 60-4018, 80-55-06, A43D2	250 HB	9.2
U.S. - ASTM A536: Grade 120-90-02; SAE J434c: Grade DQ&T, 100-70-03	330 HB	9.3
U.S. - ASTM A532: Class I, Type D; Class II, Types A, B, C, D, E; Class III, Type A	400 HB	10.0
U.S. - ASTM A532: Class I, Type D; Class II, Types A, B, C, D, E; Class III, Type A	400 HB	10.1
U.S. - ASTM A217: Grade CA-15; ASTM A296: Grades CA-15, CA-15M, CA-40; ASTM A426: Grades CP7, CP9, CPCA15; ASTM A487: Classes CA15a, CA-15M	200 HB	15.11
U.S. - ASTM A351: Grade CD-4MCu; ACI Grade CB-7Cu; ACI Grade CD-4MCu; 17-4 PH; AM-355, 403, 416, 430, 410, 405, 420, 431, 431F, 434, CA6-NM, 405, HNV6, 446, EV8, S44400	330 HB	15.12
U.S. - ASTM A351: Grade CD-4MCu; ACI Grade CB-7Cu; ACI Grade CD-4MCu; 17-4 PH; AM-355, 630, 17-4 PH	330 HB	15.13
U.S. - ASTM A297: Grades HD, HE, HF, HH, HI, HK, HL, HN, HP, HT, HU; ASTM A608: Grades HD50, HE35, HF30, HH30, HH33, HI35, HK30, HK40, HL30, HL40, HN40, HT50, HU50	200 HB	15.21
U.S. - ASTM A351: Grade CD-4MCu; ACI Grade CB-7Cu; ACI Grade CD-4MCu; 17-4 PH; AM-355, 304L, 304, 303, 301, 304LN 316, 316LN, 316L, 317L, UNS V 0890A, 321, 347, 316 Ti, 318, 309, 310S, 308	330 HB	15.22
U.S. - ASTM A297: Grades HD, HE, HF, HH, HI, HK, HL, HN, HP, HT, HU; ASTM A608: Grades HD50, HE35, HF30, HH30, HH33, HI35, HK30, HK40, HL30, HL40, HN40, HT50, HU50, 17-7 PH	330 HB	15.23
U.S. - ASTM A217: Grades C5, C12; ASTM A296: Grades CB-30, CC-50, CE-30, CA6N, CA-6NM, CD4MCu; ASTM A297: Grade HC; ASTM A497: Class CA6NM; ASTM A608: Grade HC30, NO8028, S31254	230 HB	15.51

Example metal materials	Hardness	Cut code
U.S. - ASTM A217: Grades C5, C12; ASTM A296: Grades CB-30, CC-50, CE-30, CA6N, CA-6NM, CD4MCu; ASTM A297: Grade HC; ASTM A497: Class CA6NM; ASTM A608: Grade HC30, S31500, S32900	260 HB	15.52
U.S. - A-286, Incoloy Alloy 800, Incoloy 800H, Incoloy Alloy 801, Incoloy Alloy 802, N-155, V-57, W-545, 15-25-6, 19-9DL, S32304, S31803	200 HB	20.11
U.S. - A-286, Incoloy Alloy 800, Incoloy 800H, Incoloy Alloy 801, Incoloy Alloy 802, N-155, V-57, W-545, 15-25-6, 19-9DL, 330	280 HB	20.12
U.S. - Hayne Alloy 263, Incoloy Alloy 901, Incoloy Alloy 903, Inconel Alloy 617, Inconel Alloy 625, Inconel Alloy 702, Inconel Alloy 706, Inconel Alloy 718, Inconel Alloy 721, Inconel Alloy 722, Inconel Alloy X-750, Inconel Alloy 751, M252, Nimonic 75, Nimonic 80, Waspaloy DIN - 2.4665, 2.4668, 2.4819, 2.4856 EN - 17750, 10204, 17744, 10095	250 HB	20.21
U.S. - Hayne Alloy 263, Incoloy Alloy 901, Incoloy Alloy 903, Inconel Alloy 617, Inconel Alloy 625, Inconel Alloy 702, Inconel Alloy 706, Inconel Alloy 718, Inconel Alloy 721, Inconel Alloy 722, Inconel Alloy X-750, Inconel Alloy 751, M252, Nimonic 75, Nimonic 80, Waspaloy, 5390A, 5666	350 HB	20.22
U.S. - Hastelloy Alloy B, Hastelloy Alloy B-2, Hastelloy C, Hastelloy Alloy C-276, Hastelloy Alloy G, Hastelloy Alloy S, Hastelloy Alloy X, Incoloy Alloy 804, Incoloy Alloy 825, Incoloy Alloy 825, Inconel Alloy 600, Inconel Alloy 601, Refractaloy 26, Udimet 630	275 HB	20.23
U.S. - Hastelloy Alloy B, Hastelloy Alloy C, ASTM A296: Grades CW-12M, N-12M, CY-40; ASTM A297: Grades HW, HX; ASTM A494: Grades N-12M-1, N-12M-2, CY-40, CW-12M-1, CW-12M-2; ASTM A08: Grades HW50, HX50, 5660, 5391, 5383, 4676, AMS 5399, AMS 5544	320 HB	20.24
U.S. - AiResist 213, Haynes Alloy 25 (L605), Haynes Alloy 188, J-1570, MAR-M905, MAR-M918, S-816, V-36	200 HB	20.31
U.S. - AiResist 213, Haynes Alloy 25 (L605), Haynes Alloy 188, J-1570, MAR-M905, MAR-M918, S-816, V-36	300 HB	20.32
U.S. - AiResist 13, AiResist 215, FSX-414, HS-6, HS-21, HS-31 (X-40), HOWMET #3, MAR-M302, MAR-M322, MAR-M509, NASA Co-W-Re, WI-52, X-45, 5537C, AMS 5772	320 HB	20.33
U.S. - 99.5	350 Tensile Strength	23.1
U.S. - Ti-5Al-2Sn-2Zr-4Mo-4Cr (ti-17), Ti-6Al-6V-2Sn, Ti-7Al-4Mo, Ti-8Al-1Mo-1V DIN - 3.7114, 3.7165 EN - 17851 (90), 17850	320 Tensile Strength	23.21

Example metal materials	Hardness	Cut code
U.S. - Ti-6Al-4V, Ti-6Al-4V ELI, Ti-6Al-2Sn-4Zr-2Mo, Ti-6Al-2Sn-4Zr-2Mo-.25Si, Ti-6Al-2Sn-4Zr-6Mo	1050 Tensile Strength	23.22
U.S. - EC, 1060, 1100, 1145, 1175, 1235, 2011, 2014, 2017, 2018, 2021, 2024, 2025, 2117, 2218, 2219, 2618, 3003, 3004, 3005, 4032, 5005, 5050, 5052, 5056, 5083, 5086, 5154, 5252, 5254, 5454, 5456, 5457, 5652, 5657, 6053, 6061, 6063, 6066, 6070, 6101, 6151, 6253, 6262, 6453, 6951, 7001, 7004, 7005, 7039, 7049, 7050, 7075, 7079, 7175, 7178, AMS R54520, AMS R56400, AMS R56401 DIN - 3.0517, 3.3211, 3.3523 EN - 4004, 485-2, AW5052	60 HB	30.11
U.S. - EC, 1060, 1100, 1145, 1175, 1235, 2011, 2014, 2017, 2018, 2021, 2024, 2025, 2117, 2218, 2219, 2618, 3003, 3004, 3005, 4032, 5005, 5050, 5052, 5056, 5083, 5086, 5154, 5252, 5254, 5454, 5456, 5457, 5652, 5657, 6053, 6061, 6063, 6066, 6070, 6101, 6151, 6253, 6262, 6453, 6951, 7001, 7004, 7005, 7039, 7049, 7050, 7075, 7079, 7175, 7178 DIN - 1743-2 Z110, 1743-2 Z2720, 1743-2 Z810 EN - CEN EN12844(98) ZP12, CEN EN12844(98) ZP27, CEN EN12844(98) ZP8	100 HB	30.12
U.S. - 360.0, A360.0, 380.0, A380.0, C443.0, 518.0 DIN - 3.3215, 3.3547, 3.5662, 3.5912, 9.5912 EN - AW-6082, AW-5083, 1753(97) MC21230, 1753 (97) MC21120, 1753(97) MC21121	75 HB	30.21
U.S. - 383.0, A384.0, 413.0, A413.0, SC64D, GD-AISI12, 356.1, A413.0, A380.1, A413.1, A413.2, A360.2 DIN - 3.2151, 3.2341, 3.2371, 1743-2 Z410, 1743-2 Z430, 226A EN - 1706(98) AC-45500, 1706(98) AC-42200, 1706(98) AC-42100, CEN EN 12844(98) ZP5, CEN EN 12844(98) ZP2, 1706(98) AC-46200	90 HB	30.22
U.S. - 383.0, A384.0, 413.0, A413.0, 356.1, A413.0, A380.1, A413.1, A413.2, A360.2	30 HB	30.3
U.S. - A140, 201.0, 208.0, 213.0, 222.0, 224.0, 242.0, 295.0, B295.0, 308.0, 319.0, 328.0, A332.0, F332.0, 333.0, 354.0, 355.0, C355.0, 356.0, A356.0, 357.0, 359.0, B443.0, 514.0, A514.0, B514.0, 520.0, 535.0, 705.0, 707.0, A712.0, D712.0, 713.0, 771.0, 850.0, A850.0, B850.0, Hiduminim RR-350	130 HB	30.41
U.S. - 383.0, A384.0, 413.0, A413.0	130 HB	30.42
U.S. - 834, 836, 838, 842, 844, 848, 852, 852, 854, 855, 857, 858, 864, 867, 879, 928, 932, 934, 935, 937, 938, 939, 943, 944, 945, 953, 954, 956, 973, 974, 976, 978 DIN - 2.0291	110 HB	33.1

Example metal materials	Hardness	Cut code
EN - CEN 12167 CW603N		
U.S. - 801, 803, 805, 807, 809, 811, 813, 814, 815, 818, 820, 822, 824, 825, 826, 827, 828, 863, 902, 907, 909, 910, 911, 913, 916, 917, 962, 963, 964, 966, 993 DIN - 2.0335, 2.0383, 1719, 20380 EN - CEN EN 1652(98) CW507L, 14640, 12659, 12164	90 HB	33.2
U.S. - 801, 803, 805, 807, 809, 811, 813, 814, 815, 818, 820, 822, 824, 825, 826, 827, 828, 863, 902, 907, 909, 910, 911, 913, 916, 917, 962, 963, 964, 966, 993 DIN - 2.0531, 2.0598, 2.0976, 1787, 12165, 17655 EN - 1982-CC765S-GS, 1982(98) CC762S, CEN EN 12451 CW300G, Cu-ETP, 12165, 1982(98) CC498K	100 HB	33.3

### Cut codes by example plastic material

Example plastic material	Cut code
Polyamides (Nylons): 35% Glass Reinforced - Types 6/10, 6/12	41.11
Polyamides (Nylons): 35% Glass Reinforced - Types 6, 6/6	41.21
Silicone-Glass Filled	42.11
Allyl - Glass Filled	42.12
Polyimide - Glass Filled	42.13
Acrylic, Acetal, Polycarbonate, Polysulfone, Polystyrene	51.21
Fluorocarbons: (TFE) Tetrafluoroethylene, (CTFE) Chlorotrifluoroethylene	51.22
(ABS) Acrylonitrile-Butadiene-Styrene, Polyarylether, Polypropylene, Polyethylene, Cellulose Acetate	51.31
Polyamides (Nylons): Unfilled - Types 6, 6/6, 6/12, 11, 12	51.32
Silicone	52.11
Furan, Polybutadiene	52.12
Polyurethane	52.13
Allyl - Fiber Filled	52.14
Polyurethane	52.15
Allyl (DAP)	52.21
Epoxy, Melamine, Phenolic	52.31
Polyimide	52.32
Allyl - Glass Filled	42.12

### Cut codes by material trade name

Trade name	Material type	Description	Cut code
OVAKO 520M (Ovako Steel), FORMAX (Uddeholm Tooling), IMACRO NIT (Imatra Steel)	Steel	Low-alloy, non-hardened	2.1



INEXA 482 (XM) (Inexa Profil), S355J2G3, C45 (XM), 16MnCrS5 (XM), INEXA280 (XM), 070M20(XM), HARDOX 500 (SSAB - Swedish Steel Corp.), WELDOX 700 (SSAB - Swedish Steel Corp.)	Steel	Low-alloy, non-hardened	2.2
SANMAC 304 (Sandvik Steel), SANMAC 304L, SANMAC 316, SANMAC 316L	Stainless Steel	Austenitic material	5.21 / 15.21
2554 SMO, 654 SMO, SANMAC SANICRO (Sandvik Steel)	Stainless Steel	Austenitic material	5.23 / 15.23
SANMAC SAF 2205 (Sandvik Steel), SANMAC SAF 2507	Stainless Steel	Austenitic/ferritic material	5.52 / 15.52
Incoloy 800	Heat Resistant Super Alloy	Iron base	20.11
Haynes 600, Nimocast PD16, Nimonic PE 13, Rene 95	Heat Resistant Super Alloy	Nickel base	20.2
Hastelloy C, Incoloy 825, Inconel 600, Monet 400	Heat Resistant Super Alloy	Nickel base	20.21
Inconel 700, Inconel 718, Mar - M 432, Nimonic 901, Waspaloy	Heat Resistant Super Alloy	Nickel base	20.22
Jessop G 64	Heat Resistant Super Alloy	Nickel base	20.24
Air Resist 213, Jetalloy 209	Heat Resistant Super Alloy	Cobalt base	20.3

### Cut codes by recommended speed and feed

Carbide speed (m/min)	Carbide feed (mm/r)	HSS speed (m/min)	HSS feed (mm/r)	Cut code
5.00	0.10	4.00	0.10	20.33
9.50	0.10	5.00	0.10	20.32
32.50	0.09	8.00	0.25	20.11
32.50	0.09	6.00	0.20	20.12
32.50	0.09	6.00	0.10	20.31
40.00	0.15	18.00	0.04	4.1
50.00	0.08	6.00	0.10	20.21
50.00	0.08	5.00	0.10	20.22
50.00	0.08	5.00	0.10	20.23



Carbide speed (m/min)	Carbide feed (mm/r)	HSS speed (m/min)	HSS feed (mm/r)	Cut code
50.00	0.08	2.00	0.10	20.24
60.00	0.11	17.00	0.30	6.33
60.00	0.14	8.00	0.20	23.21
60.00	0.14	9.00	0.18	23.22
75.00	0.11	14.00	0.23	6.32
82.50	0.20	12.00	0.20	3.22
87.00	0.14	29.00	0.30	23.1
87.00	0.30	20.00	0.36	5.22
90.00	0.10	21.00	0.30	8.3
95.00	0.11	14.00	0.23	3.13
100.00	0.12	9.00	0.23	15.22
100.00	0.12	14.00	0.23	15.23
104.40	0.13	5.00	0.13	10.1
107.50	0.09	74.00	0.50	30.11
110.00	0.10	23.00	0.20	7.3
110.00	0.12	20.00	0.30	5.51
110.00	0.12	20.00	0.30	5.52
110.00	0.12	14.00	0.23	15.21
116.00	0.14	11.00	0.23	5.12
116.00	0.14	11.00	0.23	5.12
116.00	0.40	9.00	0.30	5.23
120.83	0.10	9.00	0.15	9.3
120.83	0.13	5.00	0.13	10.0
120.83	0.15	21.00	0.04	4.0
121.80	0.11	19.50	0.40	6.3
130.00	0.12	12.00	0.20	3.21
140.00	0.14	26.00	0.30	7.2
142.10	0.14	9.00	0.23	15.12
145.00	0.14	17.00	0.30	5.13
145.00	0.14	17.00	0.30	5.13
147.90	0.14	9.00	0.23	15.13
150.00	0.12	15.00	0.30	5.21
150.00	0.14	14.00	0.25	9.2
150.00	0.16	36.50	0.50	30.21
160.00	0.05	18.00	0.30	15.51
160.00	0.05	18.00	0.30	15.52
160.00	0.12	18.00	0.30	6.2
170.00	0.14	15.00	0.30	1.5
170.00	0.14	14.00	0.30	2.2
170.00	0.14	20.00	0.40	5.11
170.00	0.14	39.50	0.40	8.2
170.00	0.18	40.00	0.40	7.1

Carbide speed (m/min)	Carbide feed (mm/r)	HSS speed (m/min)	HSS feed (mm/r)	Cut code
170.00	0.18	30.50	0.40	9.1
180.00	0.14	15.00	0.25	3.11
197.20	0.14	18.00	0.40	15.11
200.00	0.08	23.50	0.36	6.1
203.00	0.40	32.00	0.50	30.42
204.71	0.12	15.00	0.25	3.2
210.00	0.12	23.50	0.40	2.12
210.00	0.14	23.50	0.45	1.3
210.00	0.14	17.00	0.45	1.4
220.00	0.12	25.50	0.45	2.1
230.00	0.14	23.50	0.45	1.2
230.00	0.16	18.00	0.40	33.2
234.90	0.16	18.00	0.40	33.3
250.00	0.18	60.00	0.55	8.1
270.00	0.08	26.50	0.50	1.1
272.60	0.40	63.50	0.40	30.41
283.50	0.18	n/a	n/a	42.11
290.00	0.08	26.50	0.50	1.0
300.00	0.16	32.00	0.50	30.22
300.00	0.16	51.50	0.40	33.1
307.06	0.14	15.00	0.25	3.1
324.00	0.12	n/a	n/a	41.11
350.00	0.16	63.50	0.50	30.12
364.50	0.12	n/a	n/a	41.21
364.50	0.12	n/a	n/a	42.12
364.50	0.12	n/a	n/a	42.13
364.50	0.18	35.11	1.47	52.11
409.41	0.14	20.00	0.40	5.1
443.53	0.14	18.00	0.30	5.2
459.00	0.12	30.48	0.98	52.14
459.00	0.18	50.35	1.47	52.12
459.00	0.18	50.35	1.47	52.13
621.00	0.18	50.35	1.47	52.15
621.00	0.18	50.35	1.47	52.21
661.50	0.18	79.50	1.47	51.21
661.50	0.18	79.50	1.47	51.22
678.60	0.50	63.50	0.50	30.3
823.50	0.18	59.63	1.47	51.31
823.50	0.18	59.63	1.47	51.32
823.50	0.18	59.63	1.47	52.31
823.50	0.18	59.63	1.47	52.32

## Cut codes by recommended speed and feed, relative to mild steel

Carbide speed ratio	Carbide feed ratio	HSS speed ratio	HSS feed ratio	Cut code
0.02	1.28	0.15	0.20	20.33
0.04	1.25	0.19	0.20	20.32
0.06	1.00	0.19	0.20	20.23
0.12	1.13	0.30	0.50	20.11
0.12	1.13	0.23	0.20	20.31
0.14	1.13	0.23	0.40	20.12
0.15	1.88	0.68	0.08	4.1
0.19	1.00	0.23	0.20	20.21
0.19	1.00	0.19	0.20	20.22
0.19	1.00	0.08	0.20	20.24
0.22	1.38	0.64	0.60	6.33
0.22	1.75	0.30	0.40	23.21
0.22	1.75	0.34	0.36	23.22
0.28	1.38	0.53	0.46	6.32
0.30	1.50	0.75	0.72	5.22
0.30	1.75	1.09	0.60	23.1
0.31	2.50	0.45	0.40	3.22
0.35	1.38	0.53	0.46	3.13
0.36	1.63	0.19	0.26	10.1
0.37	1.50	0.34	0.46	15.22
0.37	1.50	0.53	0.46	15.23
0.40	1.13	2.79	1.00	30.11
0.40	1.50	0.34	0.60	5.23
0.40	1.75	0.42	0.46	5.12
0.41	1.50	0.75	0.60	5.51
0.41	1.50	0.75	0.60	5.52
0.41	1.50	0.53	0.46	15.21
0.42	1.25	0.34	0.30	9.3
0.42	1.38	0.74	0.80	6.3
0.42	1.63	0.19	0.26	10.0
0.42	1.88	0.79	0.08	4.0
0.48	1.50	0.45	0.40	3.21
0.49	1.75	0.34	0.46	15.12
0.50	1.25	0.87	0.40	7.3
0.50	1.75	0.64	0.60	5.13
0.51	1.75	0.34	0.46	15.13
0.52	1.75	0.98	0.60	7.2
0.56	1.50	0.57	0.60	5.21

Carbide speed ratio	Carbide feed ratio	HSS speed ratio	HSS feed ratio	Cut code
0.56	1.75	0.53	0.50	9.2
0.56	2.00	1.38	1.00	30.21
0.59	0.63	0.68	0.60	15.51
0.59	0.63	0.68	0.60	15.52
0.59	1.50	0.68	0.60	6.2
0.63	1.75	0.57	0.60	1.5
0.63	1.75	0.53	0.60	2.2
0.63	1.75	0.75	0.80	5.11
0.63	1.75	1.49	0.80	8.2
0.63	2.25	1.51	0.80	7.1
0.63	2.25	1.15	0.80	9.1
0.67	1.75	0.57	0.50	3.11
0.68	1.75	0.68	0.80	15.11
0.70	5.00	1.21	1.00	30.42
0.71	1.50	0.57	0.50	3.2
0.72	1.25	0.79	0.60	8.3
0.74	1.00	0.89	0.72	6.1
0.78	1.50	0.89	0.80	2.12
0.78	1.75	0.89	0.90	1.3
0.78	1.75	0.64	0.90	1.4
0.81	1.50	0.96	0.90	2.1
0.81	2.00	0.68	0.80	33.3
0.85	1.75	0.89	0.90	1.2
0.85	2.00	0.68	0.80	33.2
0.93	2.25	2.26	1.10	8.1
0.94	5.00	2.40	0.80	30.41
1.00	1.00	1.00	1.00	1.1
1.06	1.75	0.57	0.50	3.1
1.07	1.00	1.00	1.00	1.0
1.11	2.00	1.21	1.00	30.22
1.11	2.00	1.94	0.80	33.1
1.30	2.00	2.40	1.00	30.12
1.41	1.75	0.75	0.80	5.1
1.53	1.75	0.68	0.60	5.2
2.34	6.25	2.40	1.00	30.3



# 3 Process Group Site Variables

The aPriori Process Group Site Variables tool allows you to adjust the process group site variables that apply to all your VPEs.

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This chapter includes the following topics:

- Overview of Process Group Site Variables
  - Site Variable best practices
  - Site Variable procedures
  - Scenario-specific site variable overrides
-

# Overview of Process Group Site Variables

aPriori uses global variables that impact all the VPEs for a process group at your site. These global variables influence how aPriori analyzes geometric cost drivers (GCDs).

**Note** We recommend that you attend VPE Manager Training and contact aPriori Support if you have questions before using the aPriori Process Group Site Variables tool to edit these global variables.

All the VPEs provided with your installation of aPriori have been created and tested to reflect specific costing behavior. Changes to these site variables will impact cost estimates for all components using the VPEs in your deployment.

## Site Variable best practices

We recommend that you use the following best practices to ensure that VPE changes are applied in a controlled and consistent manner:

- Make any VPE modifications in a staging environment before moving them to production.
- Create a data maintenance plan for each VPE to ensure that VPE data is kept current.
- Ensure that anyone editing VPE data attends aPriori Administrator training or engages with aPriori Professional Services for support.

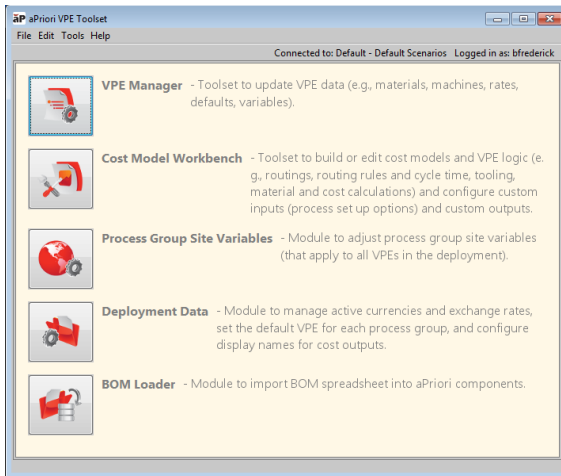
## Site Variable procedures

The aPriori Process Group Site Variables tool allows you to edit the global variables for the aPriori application deployed at your site. It also allows you to export and import a deployment's site variables; for example, it allows you to export variables from a staging environment and import them into a production environment.

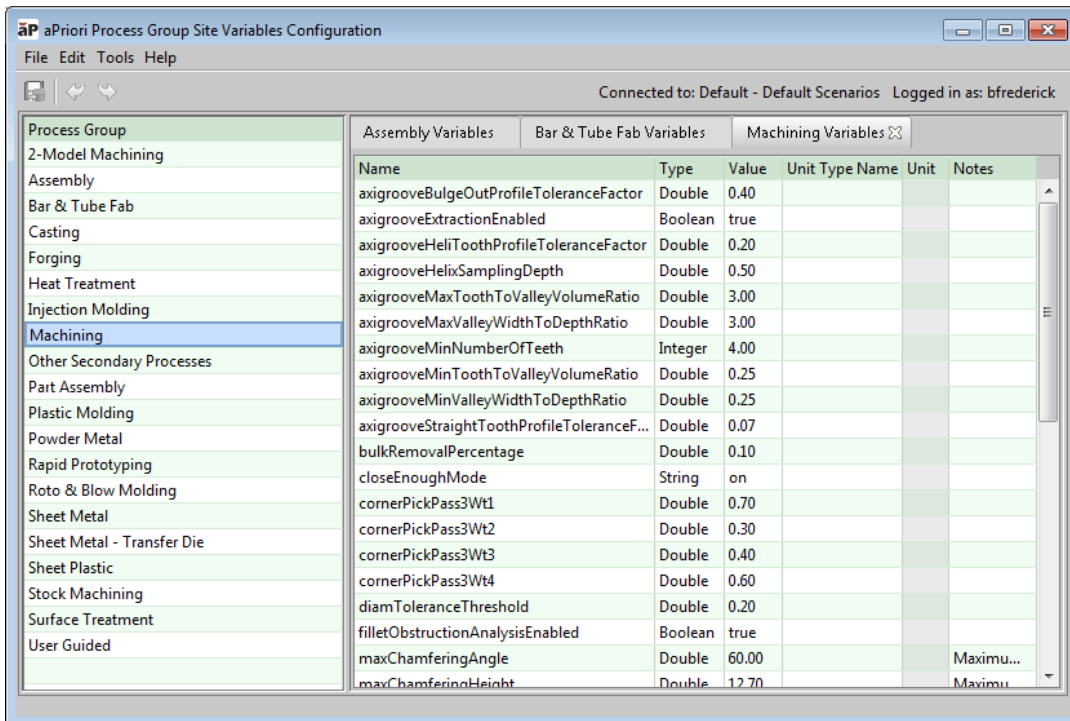
Note that aPriori provides the ability to define and set scenario-specific site variable overrides, as described later in this chapter.

### To start the Process Group Site Variables tool

- 1 Select **Tools > VPE Toolset** from the aPriori menu bar to display the **aPriori VPE Toolset** window.



- 5 Click **Process Group Site Variables** to display the aPriori Process Group Site Variables tool, then select a process group from the left column.




### To edit site variables

- 1 Review the deployment site shown in the aPriori Process Group Site Variables toolbar to verify that you are editing the global variables for the correct deployment.

For example, in the figure above, the tool will edit global variables at the Default – Default Scenarios site.

If the deployment site is incorrect, change the selection. For more information, see *To select a different deployment site*, below.

- 2 Select the process group that contains the global variables you want to edit from the **Process Group** pane to display those variables in a tab in the Data pane.

- 3 Double-click a field to edit its value.
- 4 Select **File > Publish VPE** from the VPE Manager menu bar or click  in the toolbar to save your changes.

#### **To export site variables from a deployment**

- 1 Select **File > Export > Site Variables...** from the Process Group Site Variables menu bar to display the **Select Process Groups** window.
- 2 Select the desired process groups and click **OK**. The **Export Site Variables** dialog appears.
- 3 Specify a filename and folder for the exported variables and click **Save**.



### To import site variables into a deployment

- 1 Select **File > Import > Site Variables...** from the Process Group Site Variables menu bar to display the **Import Site Variables** dialog.
- 2 Specify the `sitevars.zip` file to import and click **Open**.

### To select a different deployment site

- 1 Select **File > Switch Component Schema** from the Process Group Site Variables menu bar to display the **Select Component Schema** window.
- 2 Select the deployment site you want to edit and click **OK**.

## Scenario-specific site variable overrides

It is possible to override a site variable when you cost a scenario. If your company has different roles for VPE and System Administration, you will need to collaborate with an aPiori System Administrator to configure this functionality. In general, the System Administrator needs to create a new User Defined Attribute (UDA) with exactly the same name as the target site variable. This UDA must be configured to appear on the Cost Guide with a Display Name that makes clear which Process Group it applies to. Your users must be educated as to what this field does, and when to use it and when to leave it blank.

Note that this UDA can be further mapped to a CAD Property so that a value in the original CAD file can control the override value of the site variable.

- 1 Determine which site variable you want your users to be able to override when costing. Use the Process Group Site Variables tool as described earlier in this chapter to view the variables available in each Process Group.
- 2 Arrange to have an aPiori System Administrator create a User Defined Attribute (UDA) with exactly the same name as the site variable. This procedure is described in the aPiori *System Administration Guide*. Also ensure that the administrator creating the UDA understands exactly which Process Group this override applies to. They will need to build this into the **Display Name** that appears in the **Cost Guide**.
- 3 Ensure that the UDA appears in the **Company-Defined Attributes** section of the **Cost Guide**.
- 4 If the user doing the costing enters a value in this field, it will override the default value of the site variable. Ensure that your users understand when they should use this override, and that they should not specify a value for Process Group(s) not relevant for this site variable.



# 4 Deployment Data Administration

The Deployment Data Administration tool allows you to manage which currencies are active and the exchange rates, set the default VPE for each process group, and configure the names used for cost outputs throughout the aPriori application.

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This chapter includes the following topics:

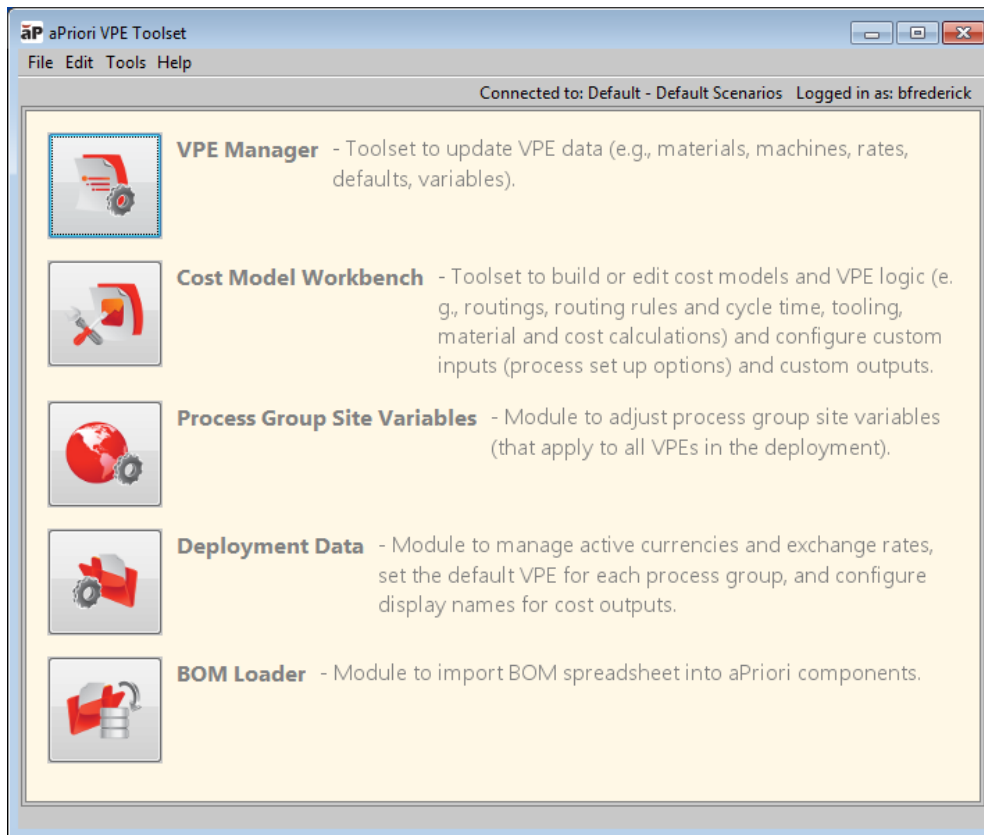
- Overview
  - Selecting your deployment site
  - Managing currency
  - Managing process groups
  - Managing cost taxonomy display names
-

# Overview of the Deployment Data admin tool

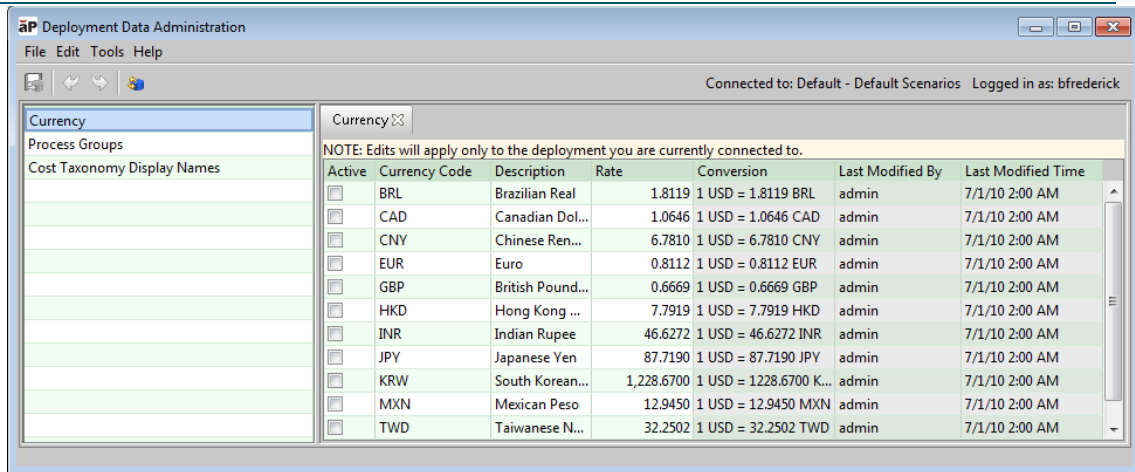
The aPriori Deployment Data Administration tool allows you to manage which currencies are active and the exchange rates, set the default VPE for each process group, and configure the names used for cost outputs throughout the aPriori application.

## To start the Deployment Data Administration tool

- 1 Select **Tools > VPE Toolset** from the aPriori menu bar to display the **aPriori VPE Toolset** window.



- 2 Click **Deployment Data** to display the Deployment Data Administration tool.



## Selecting your deployment site

Before making any changes, review the deployment site shown in the aPriori Process Group Site Variables toolbar to verify that you are editing the global variables for the correct deployment.

For example, in the figure above, the tool will edit global variables at the **Default – Default Scenarios** deployment.

If the deployment site is incorrect, change the selection. For more information, see *To select a different deployment site*, below.

### To select a different deployment site

- 1 Select **File > Switch Component Schema** from the Deployment Data Administration menu bar to display the **Select Component Schema** window.
- 2 Select the deployment site you want to edit and click **OK**.

## Managing currency

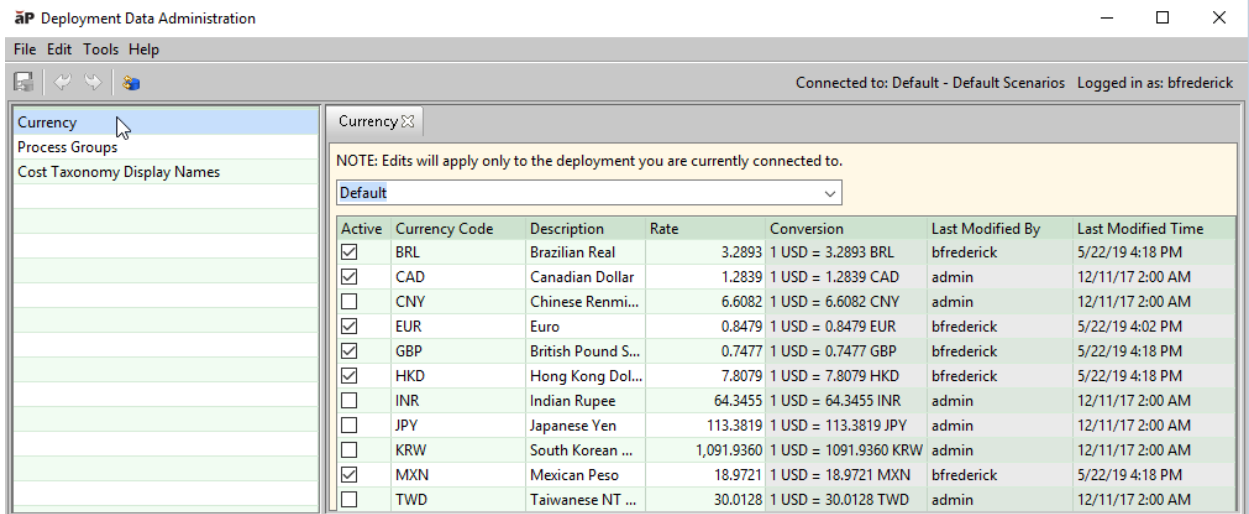
aPriori supports multiple currencies and user-defined historical exchange rate versions. This allows the user to select the currency used to display costs. It also provides the ability to save and then use different versions of historical exchange rates cost components. It can also aggregate component costs that are specified in multiple currencies and display them in a single currency.

The Deployment Data Administration tool allows you to select which currencies are active in the aPriori application, edit the currency code, description, and rate, as well as create a new currency and delete a currency. You can save this information with a user-defined version label.

You can then select a currency and (optionally) a saved exchange rate version in the main aPriori Professional UI (see the aPriori Professional User Guide), or set the currency and exchange rate version for a specific VPE (see *Editing VPE data* on page 59).

## To display currency data

- 1 Display the **Deployment Data Administration** window as described in [To start the Deployment Data Administration tool](#).
- 2 Click **Currency** in the Navigation pane to display a **Currency** tab in the Data pane.




## Selecting the currencies to display

aPriori provides an initial set of currencies that include countries with significant manufacturing capabilities. Active currencies are available in the aPriori application for display and computation. US Dollars (USD) is the only currency active by default.

**Note** USD is not listed in the currency table, though it is always active in the system. The system assumes the exchange rate for US Dollars is 1. All other currency rates must be entered into aPriori as a percent of US Dollars.

## To activate or deactivate a currency


- 1 Check the **Active** box next to the currency you want to activate in the aPriori application. Uncheck the box to deactivate the currency.
- 2 Select **File > Publish VPE** from the Deployment Data Administration menu bar or click  in the toolbar to save your changes.

## Editing currency data

The aPriori application uses the facility currency to calculate the cost of all components. If the user selects a different currency, aPriori converts the cost using the currency exchange rate specified in the Deployment Data Administration tool. These converted costs are displayed in italics and provide a tooltip that displays the exchange rate.

You can use the Deployment Data Administration tool to add, edit, and delete the currencies available to the aPriori application.

### To create a new currency

- 1 Double-click the empty cell at the end of the table and enter a currency code for the new currency.
- 2 Enter a description of the new currency and the rate, as a percentage of US Dollars.
- 3 Check the **Active** box if you want to activate the currency in the aPriori application.
- 4 Select **File > Publish VPE** from the VPE Manager menu bar or click  in the toolbar to save your changes.

An aPriori System Administrator can set this currency as a user's preferred currency using the System Admin toolkit (The preferred currency is the currency used to display cost data in aPriori.) For more information, see the *aPriori System Administration Guide*.


You can also construct VPEs that use this currency as the source currency.

### To edit currency data

- 1 Double-click in a white table cell to edit the currency data.

You can also right-click the table and select **Copy Entire Table** from the context menu to paste the table into Microsoft Excel for editing. When you are finished editing the table in Excel, right-click the table and select **Paste** from the context menu to include your edited data.


**Note** The **Conversion** cells provide a standard conversion rate for display and computation in aPriori. While currency exchange rates fluctuate on a daily basis, this daily fluctuation is not necessarily desirable in the aPriori cost assessment because it could obscure the effect of design and manufacturing decisions. We recommend that you carefully consider the frequency with which you update Rates.

- 2 Select **File > Publish VPE** from the VPE Manager menu bar or click  in the toolbar to save your changes.

### To delete a currency

- 1 Right-click the currency you want to delete and select **Remove** from the context menu to delete the currency.

**DO NOT** delete the default currency for any VPE in your deployment because it will prevent the VPE from operating correctly.

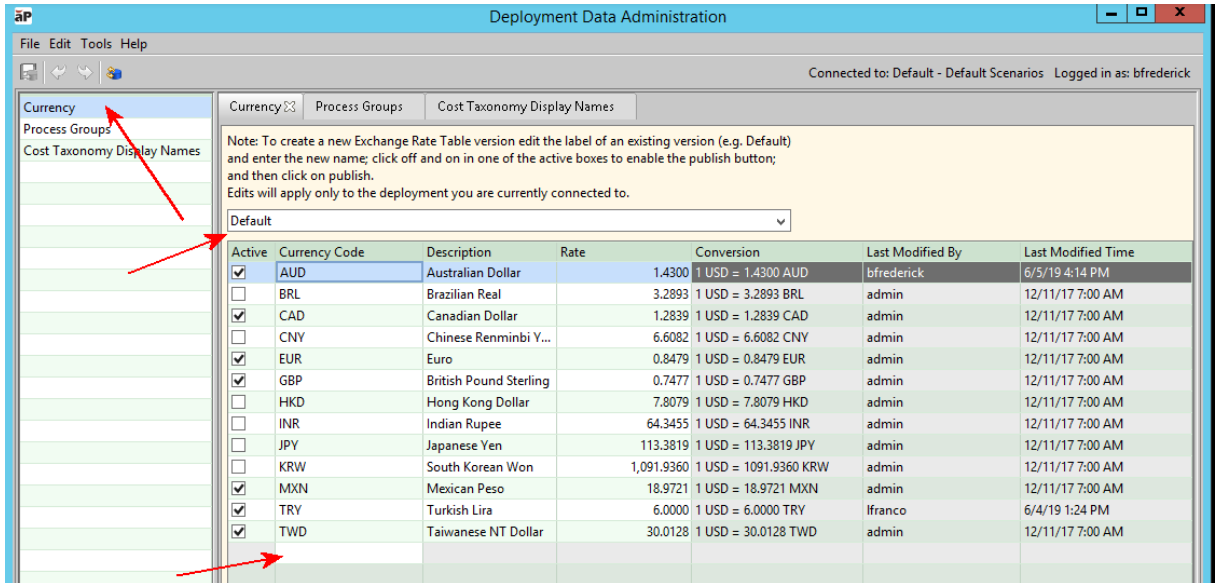
- 2 Select **File > Publish VPE** from the Deployment Data Administration menu bar or click  in the toolbar to save your changes.

## Saving an exchange rate version

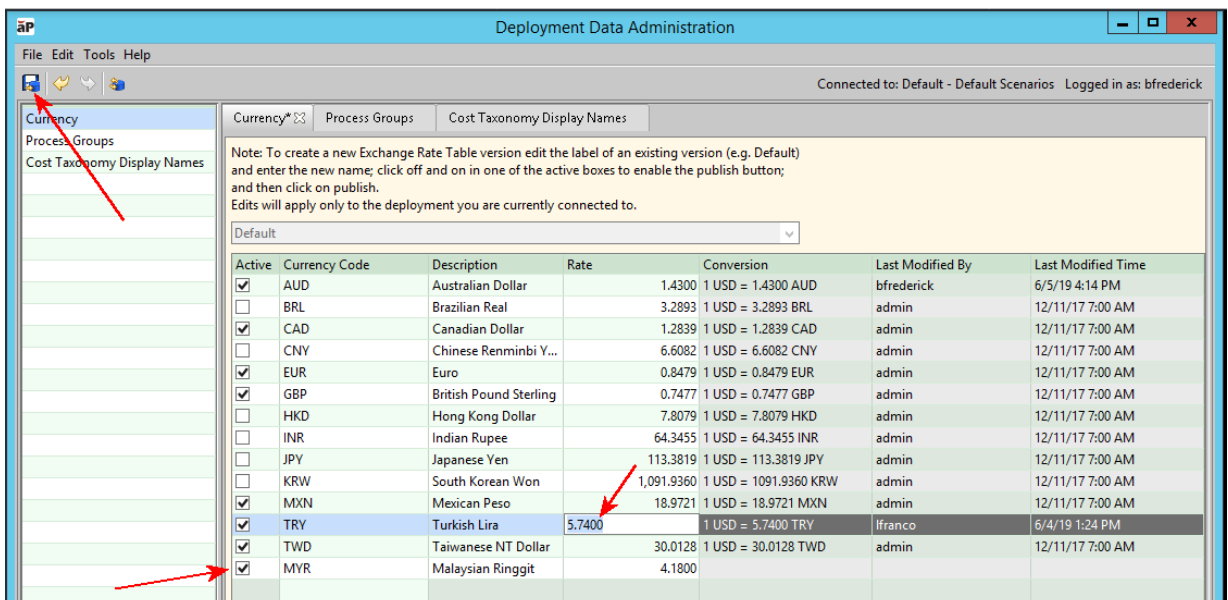
From 2019 R1 SP1 on, you can save historical exchange rates for later use. The recommended workflow is to update the **Default** currency table so that it is always up to date. Whenever you update the **Default** currency table, make a copy of it and give the

copy a descriptive version name so that it can be identified and used at a later time. For example, to add a new currency code, modify an exchange rate, and save these changes in a new version table:

- 1 Display the **Deployment Data Administration** window as described in [To start the Deployment Data Administration tool](#).
- 2 Click **Currency** in the left column, and make sure that **Default** is displayed in the pull-down menu.
- 3 To add a new currency code, double-click the first open **Currency Code** field at the bottom of the existing table.



In this example, we will add “MYR” for the Malaysian Ringgit, which as of this writing has an exchange rate of 4.18. We will also update the Turkish Lira from 6.0 to 5.74. When done, **Publish** the table so that the **Default** table now has the most up-to-date information.



- When the **Publish** action completes, click in the **Default** field and edit the name to something that indicates what version the new copy will represent, such as a date like "2019\_JUNE\_05\_a". To enable the **Publish** button again, you must make an innocuous change to the table, such as toggling a currency off and then back on again. Click Publish. When done, "Default" and "2019\_JUNE\_05\_a" will be identical, until the next time you update the Default table and create a new version copy.

**Note:** Saved exchange rate versions are currently accessible only to the aPriori Professional client and Cost Insight Report. They are not yet available to Manually Costed process groups, Bulk Costing, or Cost Insight Design.

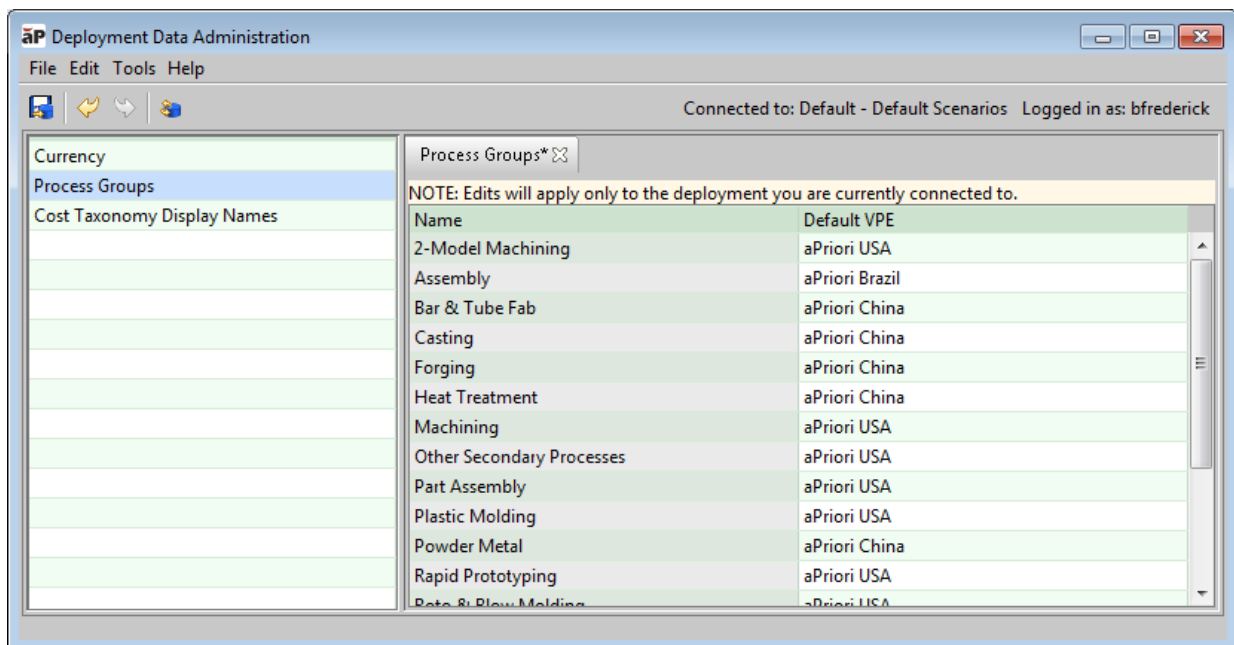
## Managing process groups

A process group is a set of processes that are of the same manufacturing type. For example, the **Sheet Metal** process group includes processes such as **Laser Cut**, **Bend Brake**, and **Shear** processes, while the **Casting** process group includes **Die Cast** and **Sand Cast** processes. Components may often be completely manufactured using processes in a single process group. Other times, a part or assembly requires multiple process groups, such as **Casting**, **Machining**, and **Finishing**.

The Deployment Data Administration tool allows you to select the default VPE for each process group.


### To display process group data

Click **Process Groups** in the Navigation pane to display a **Process Groups** tab in the Data pane.





### To set the default facility for a process group

- 1 Click **Process Groups** in the Navigation pane to display a **Process Groups** tab in the Data pane.
- 2 Double-click the **Default VPE** cell to display the drop-down list and select the default facility.
- 3 Select **File > Publish VPE** from the Deployment Data Administration menu bar or click  in the toolbar to save your changes.

## Managing cost taxonomy display names

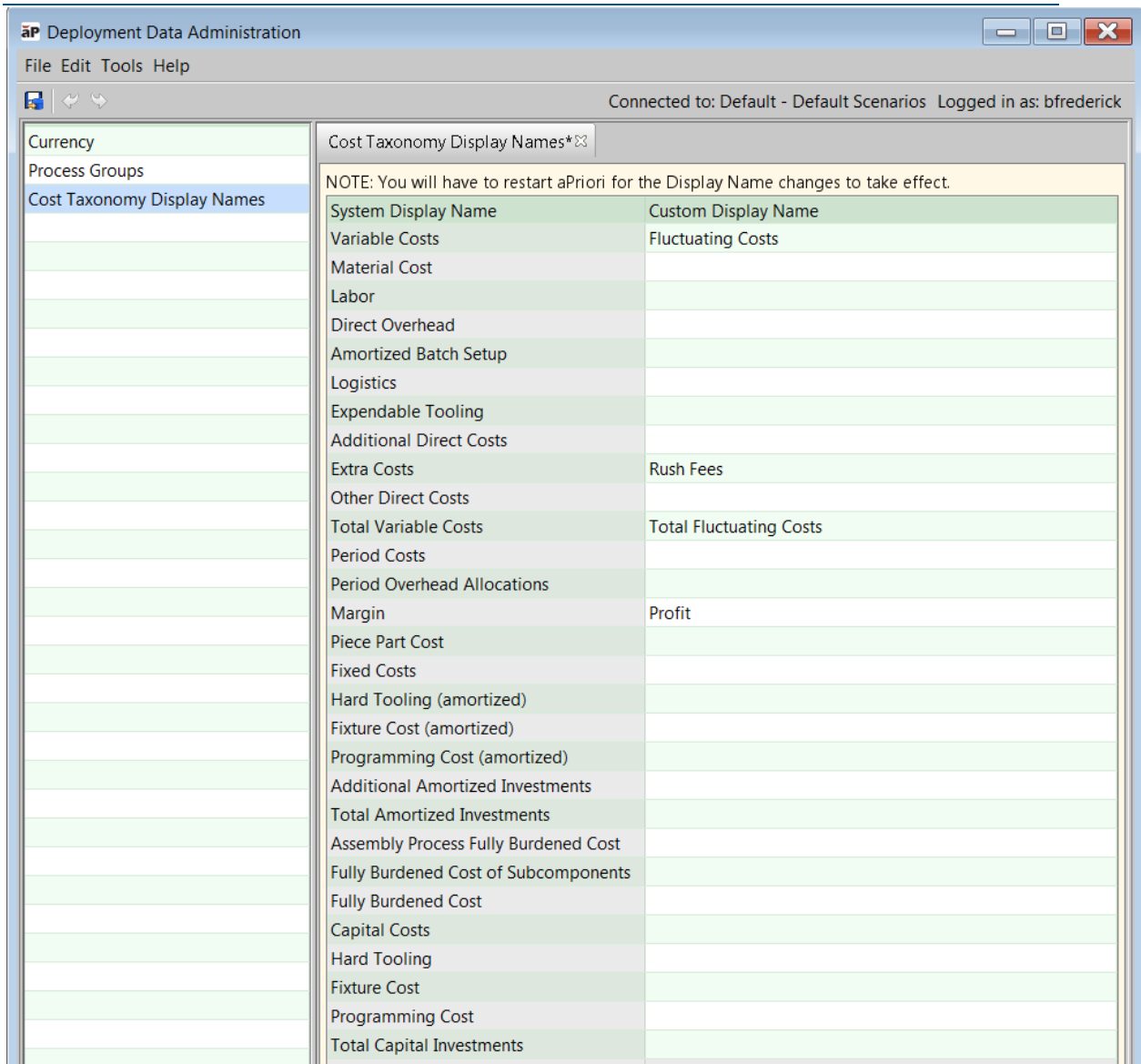
aPriori provides a set of standard names for fields and their categories in the Cost Taxonomy. For example, the name Piece Part Cost applies to the field which is the sum of the fields named Total Variable Costs, Period Overhead Allocations, and Margin. These field names are displayed throughout the aPriori application, such as on cost table tabs and in reports.

You can customize these names to:

- Reflect the terminology in use at your company. For example, you may want to rename the **Margin** field to **Profit**. Or the category of **Variable Costs** may be referred to as **Fluctuating Costs** in local jargon.
- Better represent the use of the field at your company. For example, your company may use the **Extra Costs** field to represent rush fees, so you can rename this field to **Rush Fees**.

### To display cost taxonomy display names


Click **Cost Taxonomy Display Names** in the Navigation pane of the **Deployment Data Administration** window to display the system display names and their custom display names in the Data pane.



### To change a cost taxonomy display name

- 1 Double-click the **Custom Display Name** field for the system display name you want to change and enter the name you want aPriori to display.

If no custom display name is provided, aPriori uses the system display name.

- 2 Select **File > Publish VPE** from the Deployment Data Administration menu bar or click  in the toolbar to save your changes.

aPriori users will see the new display names the next time they start aPriori.



## 5 BOM Loader

The BOM Loader maps aPriori fields to column headings read in from a comma-separated values (CSV) file, so you can generate and populate aPriori components and rollups with multiple types of cost data, including quoted costs, actual costs, user defined costs, and even cost estimates constructed outside of aPriori, such as from a spreadsheet model. You can also use the BOM loader to import lists of purchased parts and their cost data, providing the ability to load a complete parts catalog. This module is licensed separately.

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This chapter includes the following topics:

- Working with BOMs and Catalog Parts
  - Loading a BOM
  - Using the BOM Loader from the Command Line
-

## Working with BOMs and Catalog Parts

You can import bills of materials into aPriori using the BOM Loader in the VPE Toolset. The BOM Loader is a separately licensed module which lets engineers and managers quickly:

- Generate and organize new aPriori part and assembly components
- Update and organize existing components
- Add hierarchical structure to rollups
- Import lists of purchased parts and their cost data, providing the ability to load a complete parts catalog

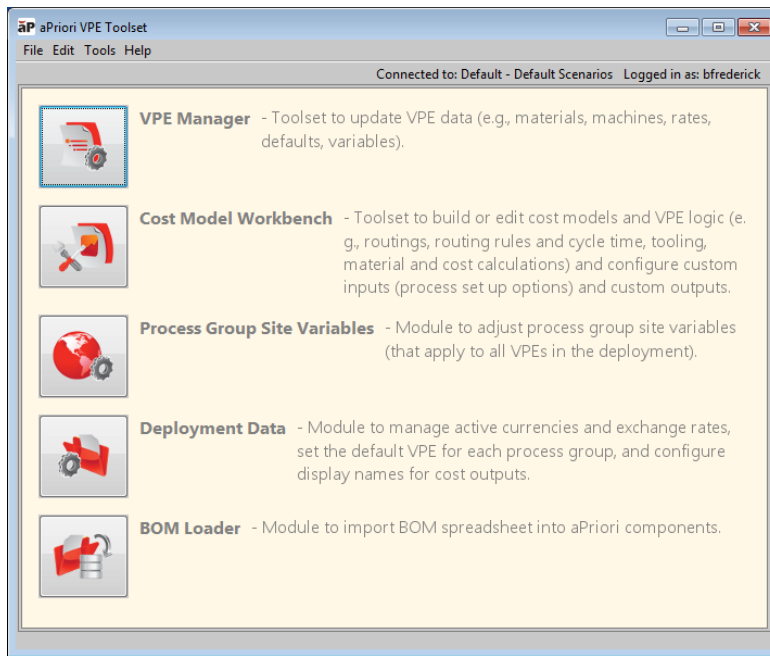
The BOM Loader is an efficient way to populate your aPriori database with components and cost data that can be rolled up and analyzed further using the BOM Comparison Report. For more information, see the "BOM Reports" section of the aPriori *User Guide*.

**Note:** In versions previous to 2015 R1, aPriori supported a separate Catalog Part Loader. This feature has now been deprecated and its functionality is now covered by the BOM Loader. To use the BOM Loader to load Catalog Parts, you must make the following explicit settings:

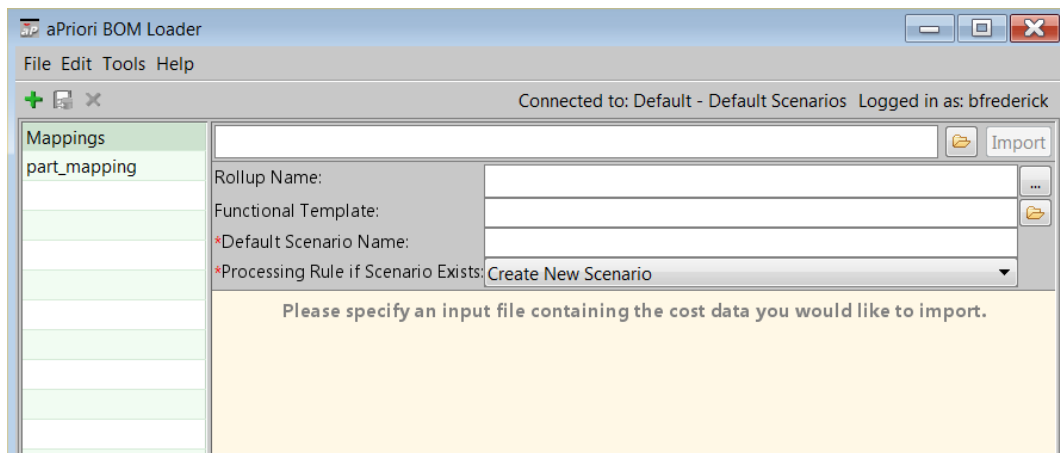
- 1 In the input file, set level and quantity to 1 for all components, and map accordingly.
- 2 In the input file, set official to `true`, and map accordingly)
- 3 Ensure that the **Calculate Values...** checkbox is checked.
- 4 Open the scenarios after importing and bulk lock them (there is no ability for the BOM loader to import scenarios as locked). -As an alternative, your System Administrator could implement an Access Control scheme that maps UDAs that only allow certain people to edit those scenarios.

### To start the BOM Loader

- 1 Select **Tools > VPE Toolset** from the aPriori menu bar to display the aPriori VPE Toolset window.



- 2 Click **BOM Loader** to display the aPriori BOM Loader tool.



This dialog and its fields are described in the next section.

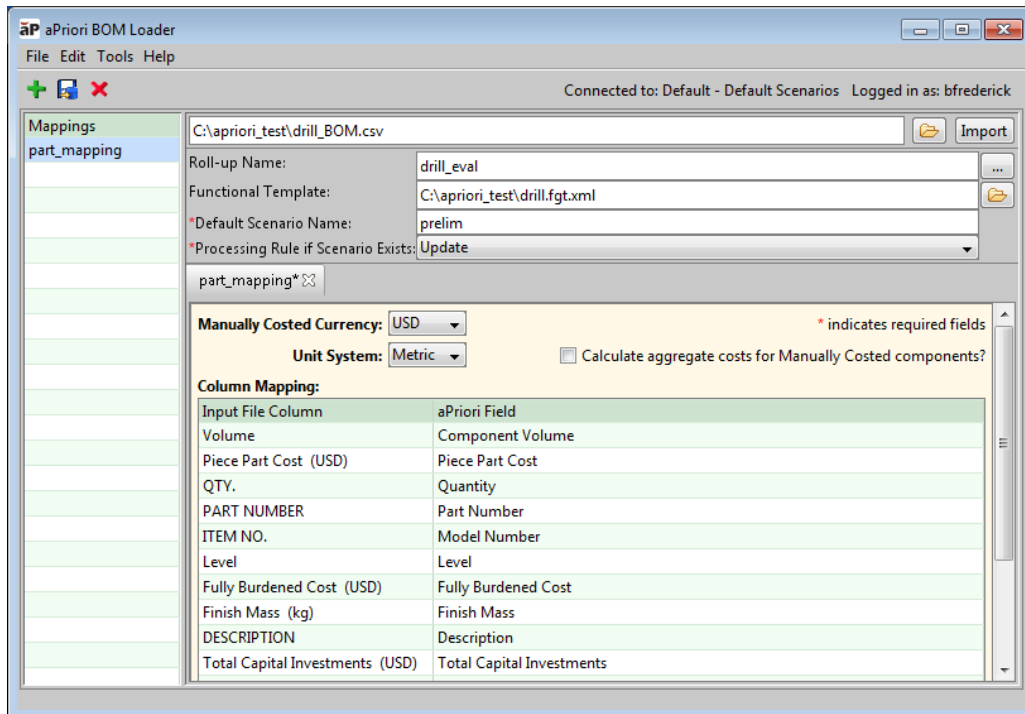
## Loading a BOM

The BOM Loader imports a comma-separated values (CSV) file that defines components and attributes and maps its column headings to aPriori fields. CSV files are typically viewed and edited in Microsoft Excel.

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.	Level	Volume	Finish Mas	Piece Part	Fully Burde	Total Capi	Primary Pr	Cost.Type	Functional	Maturity	Supplier	Scenario	Official	Currency
1	e111115	engine	1	1	14000						Actual	motor		1 Sprockets, Actual			
3	1.1 e151060	eng_block_rea	1	2	14000	0.22	45	45.10667	2000	Machining	Actual			1 Sprockets, Actual			
4	1.2 e151059	eng_bearing	2	2	28000	0.005548	1.438769	2.392669	13116	Machining	Actual			1 Sprockets, Actual			
5	1.3 e151106	eng_block_fro	1	2	14000	0.184255	3.758263	4.340824	16020	Casting	Actual			1 Sprockets, Actual			
6	1.4 e151177	cylinder	1	2	14000	0.260387	5.101233	6.587639	40876	Casting	Actual			1 Sprockets, Actual			
7	1.5 e151101	bolt	5	2	70000	0.01073	0.14	0.14		Stock Part	Actual			1 Sprockets, Actual			
8	1.6 e111068	crank	1	2	14000	0.302778					Actual			1 Sprockets, Actual			
9	1.6.1 e151212	crankshaft	1	3	14000	0.08362	2.014482	2.60972	16369	Forging	Actual			1 Internal M Actual			
10	1.6.2 e151282	flywheel	1	3	14000	0.219158	2.676209	3.391968	19683	Casting	Actual			1 Internal M Actual			
11	1.7 e111009	piston	1	2	14000	0.019759					Estimated			1 Sprockets, Estimated	FALSE	USD	
12	1.7.1 e151182	piston	1	3	14000	0.019	6	8.016	1008	Machining	Actual			1 Sprockets, Actual			
13	1.7.2 e151227	piston_pin	1	3	14000	0.000589	0.295559	0.7674	12976	Bar & Tubr	Actual			1 Sprockets, Actual			
14	1.7.3 e151308	piston_ring	1	3	14000	0.00017	0.319674	0.790836	12957	Bar & Tubr	Actual			1 Sprockets, Actual			
15	1.8 e151043	connecting_ro	1	2	14000	0.009015	0.868856	1.262943	10837	Forging	Actual			1 Sprockets, Actual			
16	2 e111230	clutch	1	1	14000	0.012324					Actual	transmissi		1 Sprockets, Actual			
17	2.1 e151148	clutch_body	1	2	14000	0.005312	1.51088	2.276678	21059	Casting	Estimated			1 Sprockets, Estimated	FALSE	USD	
18	2.2 e151091	clutch_shoe_l	1	2	14000	0.003336	1.066013	1.53944	13019	Casting	Actual			1 Sprockets, Actual			
19	2.3 e151033	clutch_shoe_r	1	2	14000	0.003336	1.066013	1.53944	13019	Casting	Actual			1 Sprockets, Actual			
20	2.4 e151285	clutch_spring	2	2	28000	0.00034	0.588143	1.735227	15772	Stock Part	Actual			1 Sprockets, Actual			



This allows you to populate aPriori components and rollups with multiple types of cost data, including quoted costs, actual costs, user defined costs, and even estimated costs generated outside of aPriori, such as from a spreadsheet model. The flexibility to load in different scenarios allows you to easily create two variants of the same product in order to estimate the cost impact of different feature sets or manufacturing approaches. You can structure the roll-up created by this BOM import with a functional group template (see the aPriori User Guide for information about functional group templates.) In the CSV file, each line represents a component (that is, either a part or an assembly).

As aPriori reads the file line by line, it either creates new component scenarios or skips or updates existing component scenarios, based on the settings of the BOM Loader field labeled Processing Rule if Scenario Exists.

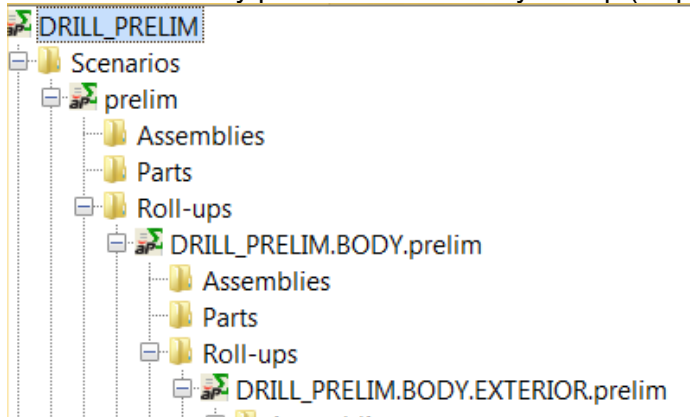


**Note:** When you load a BOM, aPriori does not do any summing of costs horizontally (that is, it will not recalculate a value in a row based on other values in that row at load time), but it will sum vertical costs (that is, a field at the assembly level will be summed from its sub-component values).

## To load a BOM

- 1 Click  next to the Import button to display the Open window. (The Open window typically opens automatically when you first bring up the BOM Loader.)
- 2 Select the CSV file that contains the BOM you want to import, then click **Open**.  
The CSV file must be formatted correctly. For more information, see *Formatting a BOM* on page 113.  
Once you select the .csv file, the window updates to display the Column Mapping pane , which is described below.
- 3 Enter a new roll-up name in the Rollup Name field.  
You can also click the “...” button to search for an existing roll-up. Select the roll-up and click **OK**.  
If you do not specify a roll-up, aPriori loads components directly to the aPriori database.
- 4 Click  next to the Functional Template field and open your functional group template. (See "Using Functional Groups" in the aPriori *User Guide* for information about defining functional group templates.)

In the Default Scenario Name field, enter a descriptive string. This name gets appended to the name of any parts and also to any roll-up (if specified).



**Note:** If a specific scenario name field is NOT present in the BOM file for a particular row, then this default name is used instead. If a specific scenario name IS specified in the BOM, then it will be used. aPriori resolves any conflicts with existing names by appending ( 2 ) , ( 3 ) , etc.

- 5 From the **Processing Rule if Scenario Exists** pull-down menu, select one of the following options:
  - **Update** – Update the existing scenario with the values imported from the BOM.
  - **Skip** – Do not update the existing scenario.
  - **Create New Scenario** – Make a copy of the existing scenario, then update the copy with values that are in the BOM load CSV file.

- 6 In the Column Mapping pane, map the Input File Column values from the CSV file to the aPriori Field values.

You must map the `Part Number`, `Quantity`, and `Level` fields to load the BOM.

You must also map any required User Defined Attribute (UDA) fields if present.

In addition to the minimum required, fields you must also set the field `Type` if you are loading in components with non-integer quantities or loading in component placeholders for assemblies (e.g. single components that will be assemblies when the product is designed). Valid fields for type include `Part`, `Assembly`, or `Bulk Item`.

Single components can be designated as assemblies in a BOM load. Additionally, `BulkItem` is used to designate non-integer components like fluids. The quantity field in aPriori does not accept non integers. When a component is specified as a `BulkItem`, the quantity from the BOM file is appended to the description field and the quantity in aPriori is set to 1.

To map a field, click the aPriori Field cell and select the field you want to map to from the drop-down list.

By default, manually costed parts are not totaled. If you wish to have these values aggregated, click the checkbox labeled **Calculate aggregate costs for Manually Costed components?** When enabled, the following fields are computed during load unless they are mapped from a value in the CSV file: other direct costs, variable costs, amortized investment, fully burdened cost, aggregate fully burdened cost, capital investment.

- 7 If you wish to specify a different currency for manually costed components only, use the drop-down menu labeled **Manually Costed Currency**. aPriori-costed components will use the currency from the VPE.
- 8 When done, click **Import** to import the information from the CSV file into aPriori and create new or update existing components and rollups.

For more information, see *BOM Loader assumptions on page 125* and *BOM loader results on page 126*.

## Formatting a BOM

The aPriori BOM Loader can import components, component specific information, and the structure of engineering BOMs. Each line of a BOM you want to import must contain data specific to a single component and data for an instance of a component must be represented on a single line.

For example, labor and material costs should not be itemized on unique rows under a particular component. Instead, labor and material costs must be loaded as columns and mapped directly to the relevant aPriori fields.

The BOM Loader imports only CSV file formats, so you must first convert Microsoft Excel or other formats to CSV files. The files must use a North American locale, so that decimals are represented by periods (.) and not by commas (,) as in EU locales.

Column headings must contain the names of the attributes you intend to map to aPriori fields in the first row of the CSV file. The BOM Loader requires that the following aPriori fields be mapped to columns in your CSV file:



- **Part Number** – Unique identifier for the component
- **Quantity** – Number of components represented in a particular row
- **Level** – Indicates depth within a BOM structure, with 1 or 0 being the top level

Required user defined attributes for component must also be mapped. For more information about user defined attributes, see the *aPriori System Administration Guide*.

aPriori will create assembly components as inferred by the BOM Loader's assumptions. For more information, see *BOM Loader assumptions* below.

## Mapping BOM Loader Headings to the UI and Spreadsheet Reports

The table below (see *Mapping BOM Loader Headings to the UI and Spreadsheet Reports*)

) lists all of the aPriori column headings that can be mapped to the columns in your BOM input file. These appear on the **aPriori Field** drop-down menu.

Manually Costed Currency: USD	
Unit System: Metric	
Column Mapping:	
Input File Column	aPriori Field
Level	<Ignore>
Name	Part Number
Scenario	<Ignore>
Currency	<Ignore>
Quantity	Quantity
Locked	*Part Number
Official	Piece Part Cost
Manually Costed	Product Line Name
Active	Programming Cost
Part Descriptor	Programming Cost (amortized)
Description	Project Name
Product Line Name	Purchased
Model Number	*Quantity
Project Name	Model Number
CAD Version	Project Name
	<Ignore>

If your site has implemented any User Defined Attributes (UDAs), they also will appear on the drop-down menu.

The three required fields (**Level**, **Part Number**, and **Quantity**) are highlighted with red asterisks (\*) in the table, the same as they appear in the menus (see the screenshot above). If your site has implemented any *required* UDAs, they also will appear with red asterisks.

Some of the following fields accept "true" or "false" values, as indicated by (True/False) in the description. It is best practice to use the syntax "true" and "false". If needed, there is additional acceptable syntax. True can be specified as a case-insensitive string true, yes, or 1. False can be specified as a case-insensitive string false, 0, or a blank field.

**Note:** Some of the names on the drop-down menu (the entries in the **Name on "aPriori Field" menu**: column) may have been redefined in your deployment. The following table lists the default names as shipped with aPriori. (To modify display names, use the VPE Administrator feature at **Tools > VPE Toolset> Deployment Data> Cost Taxonomy Display Names.**)

Unless otherwise specified, the UI name is identical to the name on the "aPriori Field" menu.

*Mapping BOM Loader Headings to the UI and Spreadsheet Reports*

Name on "aPriori Field" menu:	Found in the UI:	Spreadsheet Report Variable Name used in XML definition:	Description:
<b>Active</b>	Detail View: Cost Descriptors	active	(True/False). Applies to CAD-connected components. An Active scenario automatically updates whenever the CAD part changes. Setting a part to Inactive means that GCDs remain static even if the CAD part is updated and must be updated manually before changes to the CAD files will be reflected in the Bulk Cost operation.
<b>Additional Amortized Investments</b>	Detail View: Fixed Costs	additionalAmortizedInvestment	Fixed Investment Costs incurred to make a part that are not accounted for in Hard Tooling Programming or Fixture Costs amortized over the estimated lifetime production volume. aPriori starting point cost models do not calculate Additional Amortized Investments.
<b>Additional Direct Costs</b>	Detail View: Variable Costs, Other	additionalDirectCosts	Other costs that can be specifically associated with the manufacture of a given design. Expendable Tooling Cost per part, Additional Direct Costs, and Extra Costs are accounted for in Other Direct Costs (see below). Default value is zero.
<b>Amortized Batch Setup</b>	Detail View: Variable Costs	setupCostPerPart	The cost of configuring a machine to run a batch of a given design, accounting for machine downtime and labor

			<p>incurred. The cost is amortized to individual parts or assemblies by dividing by the number of components in a batch. For example:</p> $\frac{(\text{Setup Time} * (\text{Labor Rate} + \text{Direct Overhead Rate}))}{\text{Batch Size}}$
<b>Annual Volume</b>	Detail View: Manufacturing Info	annualVolume	Number of parts to be produced in one year.
<b>Component Height</b>	Geometric Cost Drivers	part.height	<p>The shortest dimension of the component.</p> <p><b>Note:</b> A general way to export GCDs for Spreadsheet Reports is to use the following syntax:</p> <pre>&lt;Formula&gt;gcd.parameter&lt;/Formula&gt;</pre> <p>where <i>parameter</i> is the information related to a GCD you want to export.</p> <p>Note: You may encounter aliases for this variable named part.boxHeight or part.envelopeHeight.</p>
<b>Component Length</b>	Geometric Cost Drivers	part.length	<p>The longest dimension of the component.</p> <p>Note: You may encounter aliases for this variable named part.boxLength or part.envelopeLength.</p>
<b>Component Surface Area</b>	Geometric Cost Drivers	part.surfaceArea	The total surface area of the component.
<b>Component Volume</b>	Geometric Cost Drivers	part.volume	The total finished volume of material in the component.
<b>Component Width</b>	Geometric Cost Drivers	part.width	<p>The second longest dimension of the component.</p> <p>Note: You may encounter aliases for this variable named part.boxWidth or part.envelopeWidth.</p>

<b>Copy From</b>	Cost Guide: Recently Used Settings	N/A	The costed component from which to copy the cost settings, <a href="#">in the format:</a> PartName.Scenario
<b>Cost Type</b>	Detail View: Cost Descriptors Cost Guide: Company-Defined Attributes	costType	The source that provided the cost information for the component. Choice of Design Engineering, Manufacturing, Procurement, Accounting/Finance, Program Management, Supplier, Other
<b>Currency</b>	Detail View: Applies to all monetary fields EXCEPT in the "Quoted Info" section. Cost Guide: Currency pull-down menu "View" menu > Change Currency? Tools > VPE Toolset > Deployment Data > Currency	currencyCode	Select the currency used for the costs in this row. These values will be converted to the default display currency in aPriori and will be shown in italic. Fields in the "Quoted Info" section can be set separately with "Quoted Currency" (see below).  See the "Managing Currencies" section of the "Deployment Data" chapter of the <i>aPriori VPE Administration Guide</i> for more information.
<b>Date Costed</b>	Detail View: Cost Descriptors	calculationDate	The date and time in the format: MM/DD/YYYY hh:mm:ss
<b>Description</b>	Detail View: Cost Descriptors Cost Guide: Company-Defined Attributes	description	Information that will help you identify the component. "Description" can be mapped to a CAD "description" property. See the "Using CAD Properties" chapter of the <i>aPriori System Administration Guide</i> .
<b>Direct Overhead</b>	Detail View: Variable Costs	directOverheadCost	Direct overhead accounts for machine depreciation, machine maintenance, and energy to power machines.

			In addition, you have the option of including facilities cost (rent, insurance, and utilities) in direct overhead, which by default is included in indirect overhead (see below).
<b>Expendable Tooling</b>	Detail View: Variable Costs, Other	expendableToolingCostPerPart	The cost of tooling, such as a drill bit or turret press punch, consumed during manufacturing.
<b>Extra Costs</b>	Detail View: Variable Costs, Other	extraCosts	Total of additional miscellaneous costs. By default, this value is zero in aPriori starting point cost models. Your VPE may be customized to use this field to capture specific types of costs and relabeled as needed (see the aPriori <i>Administration Guide</i> , Managing Cost Taxonomy Display Labels).
<b>Finish Mass</b>	Detail View: Component Mass	finishMass	The total finished mass of material in the component based on the final manufactured "Component Volume" and selected Material.
<b>Fixture Cost</b>	Detail View: Capital Costs	fixtureCost	The cost of devices that hold a specific part or assembly in the correct orientation on a machine during manufacture or assembly. These devices are not supposed to be re-used for a part or an assembly of a different design. The capital cost is the price to buy one set of the tooling.
<b>Fixture Cost (amortized)</b>	Detail View: Fixed Costs	fixtureCostPerPart	The cost per part of devices that hold a specific part or assembly in the correct orientation on a machine during manufacture or assembly. These devices are not supposed to be re-used for a part or an assembly of a different design.

<b>Fully Burdened Cost</b>	Detail View: Fully burdened	fullyBurdenedCost	For parts, the sum of Piece Part Cost and Fixed Costs. For assemblies, the sum of Fully Burdened Cost of Assembly Processes and Fully Burdened Cost of Subcomponents. For Roll-ups, the sum of Piece Part Cost and Fixed Costs for all first level children (parts, assemblies, roll-ups).
<b>Functional Group</b>	See "Description".	See "Description".	"Functional Group" is used to map components to an alternative hierarchy or grouping from the BOM structure. Components being loaded via the BOM Loader can be mapped to specific functional groups. Functional groups must be defined in aPriori using the Functional Group Generator. See the "Using Functional Groups" section of the aPriori <i>User Guide</i> .
<b>Hard Tooling</b>	Detail View: Capital Costs	hardToolingCost	Hard tools are purchased for creating one specific design and cannot be used to create others. The Capital Cost is the price to buy one set of the tooling.
<b>Hard Tooling Amortized</b>	Detail View: Fixed Costs	toolingCostPerPart	The cost of hard tooling per part.
<b>Image File Path</b>	Component View	N/A -- There is no "image file path" to extract once the image is in the database. However, you can incorporate the image into your report by specifying: generateThumbnails="true"  The image file will be generated in the same directory as the report.	The location of an image file that you wish to associate with a CAD-less (virtual) part or assembly. Supported image formats are: BMP, WBMP, JPG, JPEG, PNG, GIF. This image will appear where a CAD-related component typically displays a representation of the CAD model, such as the Component Viewer or Search dialog in the main aPriori GUI.

<b>Indirect Overhead</b>	Detail View: Period Costs	periodOverhead	Indirect overhead accounts for support services for quality, maintenance, planning & purchasing, manufacturing engineering (CNC programming and process planning), and tool crib. By default, indirect overhead also includes facility costs (rent, insurance, and utilities), but you have the option of moving facilities cost to direct overhead.
<b>Labor</b>	Detail View: Variable Costs	laborCost	The cost of labor needed to manufacture the part or assembly. Usually includes hourly wages and benefits.
<b>Level*</b>	Detail View: Cost Object	bomDepth	<p>*Required. Indicates depth within a BOM structure, with 1 or 0 being the top level.</p> <p><b>Note:</b> If you specify "0" as the top level, the Spreadsheet "bomDepth" top-level will be "1", and all other bomDepth values will be incremented by 1. Also, there is a Spreadsheet Report "Level" which is different than the BOM and UI "Level".</p>
<b>Logistics</b>	Detail View: Variable Costs	logisticsCost	The cost of transportation between supply chain facilities.
<b>Manually Costed</b>	Cost Guide: Basic Options (Process Group)	manuallyCosted	(True/false) Indicates that costs are specified manually and are not affected by changes to the component's GCDs, non-geometric cost drivers, or VPE data.
<b>Margin</b>	Detail View: Period Costs	margin	Profit built into the component cost estimate. By default, this is zero in aPriori starting point cost models.
<b>Material Cost</b>	Detail View: Variable Costs	materialCost	The cost of the material used to manufacture the part. Includes allocation of scrap material wasted during manufacturing. Does not

			include consumable material, such as weld wire or adhesives, only primary material.
<b>Material Overhead</b>	Detail View: Variable Costs, Other	materialOverheadCost	Additional cost attributed to purchasing, receiving, handling, storing, and delivering materials used in production.
<b>Model Number</b>	Detail View: Cost Descriptors  Cost Guide:Compa ny-Defined Attributes	modelName	Unique identifying name or number for the component.
<b>Official</b>	Detail View: Cost Descriptors	official	<p>(True/false) Specifies that this is the "Official" scenario, which in over-simplified terms is the scenario that will roll-up into an assembly or roll-up by default. See the section "Working with official scenarios" in the aPriori <i>User Guide</i> for more detailed information.</p> <p>Note that if a component has not been initialized, the first scenario specified in the BOM Loader is made official even if this field is False.</p> <p>If a subsequent scenario in the BOM Loader is marked "Official" for the component, it will supersede the official status of the first scenario.</p> <p>The BOM load is processed by the order of the rows, top to bottom</p>
<b>Other Direct Costs</b>	Detail View: Variable Costs, Other	otherDirectCosts	The subtotal of Expendable Tooling, Additional Direct Costs, and Extra Costs.
<b>Part Number*</b>	"Name": Detail View: Cost Object  "Part Number":	partNumber	(*Required.) Unique identifier for the component; the component identifier as specified in the CAD model. Maps to "Name", "Part



	Create a Virtual Part dialog "Name/Part #": Search dialog.		Number", or "Name/Part #" in different areas of the UI.
<b>Piece Part Cost</b>	Detail View: Period Costs	pieceCost	The sum of all costs of making a part, including margin if applied, but excluding Fixed (tooling-related) Costs.
<b>Product Line Name</b>	Detail View: Cost Descriptors Cost Guide: Company-Defined Attributes	productLineName	The product line on which the component is used.
<b>Programming Cost</b>	Detail View: Capital Costs	programmingCost	Cost of creating a computer program that Computer Numerical Control (CNC) machines will follow to make or assemble parts of a specific design.
<b>Programming Cost (amortized)</b>	Detail View: Fixed Costs	programmingCostPerPart	Programming Cost per part.
<b>Project Name</b>	Detail View: Cost Descriptors Cost Guide: Company-Defined Attributes	projectName	The name of the project associated with this component.
<b>Purchased</b>	Detail View: Manufacturing Info Cost Guide: Company-Defined Attributes	purchased	(True/False) Set to TRUE if you are purchasing this component from a supplier. FALSE indicates that you are making the component at one of your company's factories.
<b>Quantity*</b>	Detail View: Cost Object	countInParent	(*Required.) Quantity of the component identified in the Part Number field. Typically

			has a value of '1' unless the Part Number is a component within an Assembly and appears multiple times in the assembly.
<b>Quoted Annual Volume</b>	Detail View: Quote Info	quotedAnnualVolume	The quoted number of components to be produced per year.
<b>Quoted Currency</b>	Detail View: Applies to monetary fields ONLY in the "Quote Info" section  Cost Object Info window, Quoted Cost tab: Currency pull-down menu  "View" menu > Change Currency  Tools > VPE Toolset > Deployment Data > Currency	quotedCurrencyCode	The currency used for the quoted costs. All other monetary fields are controlled by "Currency" (see above).  See the "Managing Currencies" section of the "Deployment Data" chapter of the <i>aPriori VPE Administration Guide</i> for more information.
<b>Quoted Date</b>	Detail View: Quote Info	quotedDate	The date of the quote.
<b>Quoted Factory (Source)</b>	Detail View: Quote Info	quotedFacilityName	The factory or source for the quoted cost information.
<b>Quoted Material Composition</b>	Detail View: Quote Info	quotedMaterialComposition	The material used to create the quoted cost.
<b>Quoted Routing</b>	Detail View: Quote Info	quotedProcessRouting	The process used to create the quoted cost.
<b>Quoted Total Capital Investment</b>	Detail View: Quote Info	quotedCapitalInvestment	The total quoted capital investment cost to manufacture the component.
<b>Quoted Total Cost</b>	Detail View: Quote Info	quotedFullyBurdenedCost	The total quoted cost to manufacture the component.

<b>Revision</b>	Detail View: Cost Descriptor  Cost Guide: Company- Defined Attributes	revision	The revision number for the component. "Revision" can be mapped to a CAD "revision" property. See the "Using CAD Properties" chapter of the <i>aPriori System Administration Guide</i> .
<b>Scenario</b>	Detail View: Cost Object	scenarioName	The name of the scenario which this row defines. You can specify multiple scenarios for a single part or assembly; each scenario requires a different row.
<b>SG&amp;A</b>	Detail View: Period Costs	sgaCost	Sales, general, and administrative expenses per part.
<b>Target Cost</b>	Detail View: Cost Targets  Cost Guide: Targets	targetCost	How much you want or expect the fully burdened cost of the part to be, for comparison against costing results.
<b>Target Mass</b>	"Target Finish Mass"  Detail View: Mass Targets  Cost Guide: Targets	targetFinishMass	How much you want or expect your finished component to weigh, for comparison against costing results.
<b>Total Amortized Investment</b>	Detail View: Fixed Costs	amortizedInvestment	The sum of all fixed costs. Fixed costs must be incurred before the start of manufacturing. In aPriori, all fixed costs are amortized to the individual part or assembly by dividing the total, up-front cost for the fixed cost (the capital cost) by the total product volume.
<b>Total Capital Investments</b>	Detail View: Capital Costs	totalCapitalInvestment	The total capital investment cost to manufacture the component.
<b>Total Variable Costs</b>	Detail View: Variable Costs	totalCost	The sum of all cost items for a part, Total Variable Costs is the marginal cost associated with making "one more" part of a give design.

		This includes all variable costs associated with the creation of a part but does not include depreciation of capital tooling.
<b>Type</b>	"Cost Object Type" Detail View: Cost Descriptors	Valid entries are Assembly, Part, or BulkItem.  <b>Note:</b> "BulkItem" is provided for backward compatibility and maps to "Part" when you import the BOM.

## BOM Loader assumptions

The BOM Loader uses the following rules to generate components.

- The loader infers the parent child relationship between components based on whether the depth increased/decreases or stays the same as the prior line. If the depth increases, the next line is a child, if it remains constant, the next line is a peer. If it decreases, the next line belongs to the current line's parent, or if the depth decreases to the top level, the next line becomes a new top-level item. Note that you can explicitly set what component type (assembly or part) is to be loaded, regardless of Level values, by mapping the Type field.
- Depth is inferred by the values mapped to the Level aPriori field. Top-level depth may either be 0 or 1 – if both are present, 0 is the top level.
- Quantity describes the quantity for a component described per line item. Quantities for like components sharing the same parent are combined.
- Functional group assignments may not conflict over an assembly's structure. That is, a parent assembly may not be assigned to Functional Group 1 with sub-assemblies assigned to Functional Group 2. If a parent assembly is assigned to Functional Group 1, all its subcomponents will also be found in Functional Group 1 by association.
- By default, the currency of the costs for manually costed components being loaded are imported per the setting of the **Manually Costed Currency** drop-down menu. aPriori-costed components use the currency from the VPE. However, you can specify a Currency column in the CSV file which overrides the default setting, only for that row. If the specified currency is not supported, the BOM Loader displays an error message and the import does not succeed.
- The units of the values, such as volume, surface area, dimensions, and mass are imported per the Units selection in the BOM Loader.
- If the CSV file has an "Official" column, any row that is set to TRUE (by a case-insensitive value of , "true", "yes", or "1") will become the official scenario for that part. If more than one scenario for a part has the official column set to TRUE, then only the first one will become official; subsequent rows will be ignored.
- The CSV file accepts an optional "Scenario" column. If the value for a row is specified and the scenario exists, then aPriori creates or overwrites a copy from the specified scenario based on the selected Processing Rule for existing

- scenarios . If the specified scenario name does not already exist, then aPriori creates a new copy from the official scenario. If no scenario name is specified, then the scenario name specified in the Default Scenario Name field is used. The same rules as described above are applied to this default scenario name whether or not the component already has such a scenario. If more than one row exists for the same part name and neither have a scenario name specified (or they all have the SAME scenario name specified) then only the first row results in a new scenario being created -- the subsequent rows will all reference the scenario that was created from the first row. If the row indicates that the scenario is a child or an assembly or rollup, then the assembly ( or rollup ) only points to the official scenario if "TRUE" is in the official column AND the scenario name specified ALSO happens to be the official scenario.
- When a BOM load creates a new scenario for an existing part, it does so by copying from the existing part. If your site has implemented Access Control, in some situations this can cause the BOM load to fail due to an Access Control error -- READ privileges are checked against the existing component, to which you may not have access. For more information about Access Control, see the *aPriori System Administration Guide*.
  - When using the BOM Loader to load cost values, the input spreadsheet column which indicates whether it is manually costed must NOT be located last in the spreadsheet (to the right of other columns/fields that you will map to aPriori fields). If the “manually costed” field is in the right-most position and is mapped after the other fields, then the actual (manual) cost values from the spreadsheet are not correctly loaded into aPriori. Therefore, organize your input spreadsheet so that the column indicating whether a part is to be interpreted as manually costed is located in any position other than the last column that gets mapped to an aPriori field.
  - Top-level components from the CSV file are added to the output roll-up only if there are NO functional groups specified anywhere in CSV file, or if they themselves have a functional group specified.

BOM loader results: The following table provides a high-level summary of what happens when you import a BOM:

Before Import	After Import
<p><b>CAD based, manually costed or virtual component already exists in database</b></p>	<p>The result of this depends on the processing rule for existing scenarios:</p> <ul style="list-style-type: none"> <li>• Update – existing scenario would be updated with the specified inputs. <ul style="list-style-type: none"> <li>○ Added cost overrides and other mapped inputs</li> </ul> </li> <li>• Create a New Scenario – new manually costed scenario with “ &lt;scenario name&gt; (2)” name would be created. It would be manually costed and use “User Guided” process group. And have all specified inputs applied as usual.</li> <li>• Skip – a component scenario from CSV file will be skipped to BOM load.</li> </ul>

<b>No component exists in database</b>	A new component with scenario name (specified in “Default Scenario Name” field or mapped to “Scenario” aPriori field from CSV file) is initialized. This scenario became official, since no other scenarios present in DB. It uses the “User Defined” process group and the part is manually costed.
--	--

When you load a BOM, aPriori does all of the following:

- Creates new components in the aPriori database for new part numbers.
- Creates assembly components for new components with child components on the following lines.
- Creates part components for new components without child components on the following lines, unless you map a field in the CSV file to aPriori’s `Type` field, and the value of the field is `assembly`. (Valid values for the `Type` field are `Part`, `Assembly`, and `BulkItem`.)
- Creates a new Purchased scenario if purchased components are mapped to the `Purchased` aPriori field and the value of the field is `Yes`. This scenario combines component costs for the purchased component into the material cost field and ignores the child component costs if the component is an assembly.

If a component is of type “BulkItem” and has a non-integer quantity, aPriori creates a single new component in the assembly or roll-up with an aPriori part number comprised of the original part number value followed by the non-integer quantity.

- Creates a single new component in the assembly or roll-up for the `Part Number` listed with a non-integer quantity. The new component has an aPriori part number comprised of the original part number value followed by the non-integer quantity.
- Creates a single new component in the assembly or roll-up for the `Part Number` specified as `Type:BulkItem`. The new component has an aPriori part number comprised of the original part number value followed by the non-integer quantity.

**Note:** New BOM loaded components are created as manually costed with user guided GCDs. CAD file association works for new BOM loaded components as specified in the section “Changing the file associated with a component” section of the aPriori *User Guide*. Once a file is associated to a new BOM loaded component, you must uncheck the **Manually Costed** box to generate an aPriori process-based estimate.

## Using the BOM Loader from the Command Line

The BOM Loader provides a command line option which enables you to automate your BOM import into aPriori using a task scheduler. This is implemented in a batch file command named **bomLoad** that takes as an argument a configuration file specifying

what the BOM load run will do. This behaves exactly as if you had provided the same inputs to the BOM loader UI and clicked **"Import"**.

The template properties file and bomload.cmd file are stored in:

```
<aPriori_Install_dir>\bin\bomLoad.cmd
<aPriori_Install_dir>\ext\bom-cost-loader-plugin\command-
line\bomLoadTemplate.properties
```

The bomLoad command has the following syntax:

```
bomLoad <propertiesFile> [<username> <password>]
```

**NOTE:** If <username> and <password> are not specified on the command line, they are searched for in the properties file. If not found there, and if your aPriori administrator has implemented Single Sign On (SSO), the BOM loader attempts to use the currently logged-in user's Windows credentials.

The following properties can be specified in <propertiesFile>:

```
bomLoad.username=<username>
bomLoad.password=<password>
bomLoad.deployment =<deployment>
bomLoad.schemaname=<schemaname>
bomLoad.bomCsvFile=<pathToBOMCsvFile>
bomLoad.mapping=<mapping> Note: The specified mapping must exist in the database.
bomLoad.defaultScenarioName=<defaultScenarioName>
bomLoad.defaultScenarioProcessingRule=<create|update|skip>
bomLoad.rollupName=<rollupName> Note: Optional
bomLoad.functionalGroupTemplate=<functionalGroupTemplate> Note: Optional
```

You can configure the bomLoad.cmd script to set custom values for max heap size and max perm size by following commented instructions in the script.

To use the default settings, leave the script as is. It should look like this:

```
@call "%~dp0runAnt.cmd" -f "%ANT_SCRIPTS%/bomLoad.xml"
    "-Dapriori.propertiesFile=%PROPERTIES_FILE%" "-
    Dapriori.user=%USER%"
    "-Dapriori.password=%PASSWORD%" bomLoad
:: comment line above and uncomment lines below to override max
    heap/perm size. 1020m and 150m are example values, change
    these to the desired memory sizes
::@set MAX_HEAP_SIZE=1020m
::@set MAX_PERM_SIZE=150m
::@call "%~dp0runAnt.cmd" -f "%ANT_SCRIPTS%/bomLoad.xml"
    "-Dapriori.maxMemory=%MAX_HEAP_SIZE%"
    "-Dapriori.maxPermSize=%MAX_PERM_SIZE%"
    "-Dapriori.propertiesFile=%PROPERTIES_FILE%"
    "-Dapriori.user=%USER%" "-Dapriori.password=%PASSWORD%"
    bomLoad
```

To use custom values, comment out the first @call line and uncomment the remaining lines under the instructions comment. It should look like this:

```

::@call "%~dp0runAnt.cmd" -f "%ANT_SCRIPTS%/bomLoad.xml"
    "-Dapriori.propertiesFile=%PROPERTIES_FILE%" "-
    Dapriori.user=%USER%"
    "-Dapriori.password=%PASSWORD%" bomLoad
:: comment line above and uncomment lines below to override max
    heap/perm size.
    1020m and 150m are example values, change these to the
    desired
    memory sizes
@set MAX_HEAP_SIZE=1020m
@set MAX_PERM_SIZE=150m
@call "%~dp0runAnt.cmd" -f "%ANT_SCRIPTS%/bomLoad.xml"
    "-Dapriori.maxMemory=%MAX_HEAP_SIZE%"
    "-Dapriori.maxPermSize=%MAX_PERM_SIZE%"
    "-Dapriori.propertiesFile=%PROPERTIES_FILE%" "-
    Dapriori.user=%USER%"
    "-Dapriori.password=%PASSWORD%" bomLoad

```

**Note:** “1020m” and “150m” are example values, these should be set to the desired sizes.

All errors, status indications, and results of the import will be output to the console and to log files.

Log files are saved in `<user home>\aPriori\minorVersion\bomLoad-logs`

Java exceptions are output to the log file only.

### To use the bomLoad command

- 1 Open a Windows command window.
- 2 **cd** to `<aPriori Install folder>\bin`
- 3 Enter:

```
bomLoad <full path to the bomLoad.properties file>
```

The above example assumes that you are providing `<username>` and `<password>` through the properties file. The bomLoad.properties file must have all the required properties specified. Assuming that all supplied properties are valid, all data from the BOM csv file will be pushed to the aPriori database and the corresponding scenario files will be created or updated. The following info will appear in the console:



```

C:\windows\system32\cmd.exe
c:\aPriori14.1.1\bin>bomLoad C:\aPriori14.1.1\bin\bomLoad.properties
Buildfile: c:\aPriori14.1.1\install-support\antscripts\bomLoad.xml
bomLoad:
[.java] -----
[.java] BEGIN BOM LOAD
[.java] -----
[.java]
[.java] Inputs:
[.java] -----
[.java] Input file: E:\fbcdev\14.1\test-data\UI\bomloader\BomLoader_Import
tData.csv
[.java] Rollup name:
[.java] Functional template:
[.java] Default scenario name: ini
[.java] Processing rule: Create New Scenario
[.java] Currency: USD
[.java] Unit system: Metric
[.java] -----
[.java] Mapping: ml
[.java] -----
[.java] AdditAmortInvest: <Ignore>
[.java] AdditDirectCosts: <Ignore>
[.java] AmortizedBatchSetup: <Ignore>
[.java] Currency: <Ignore>
[.java] DirectOverhead: <Ignore>
[.java] ExpendableTooling: <Ignore>
[.java] ExtraCosts: <Ignore>
[.java] FixtureCost: <Ignore>
[.java] FixtureCostAmort: <Ignore>
[.java] FullyBurdenedCost: <Ignore>
[.java] HardTooling: <Ignore>
[.java] HardToolingAmort: <Ignore>
[.java] Logistics: <Ignore>
[.java] ManuallyCosted: <Ignore>
[.java] Margin: <Ignore>
[.java] Masymba: <Ignore>
[.java] OtherDirectCosts: <Ignore>
[.java] PeriodOverheadAllocations: <Ignore>
[.java] PiecePartCost: <Ignore>
[.java] ProgrCostAmort: <Ignore>
[.java] ProgrammingCost: <Ignore>
[.java] TargetCost: <Ignore>
[.java] TotalAmortInvestment: <Ignore>
[.java] TotalCapInvestment: <Ignore>
[.java] TotalVariableCosts: <Ignore>
[.java] functionalGroup: functionalGroup
[.java] laborCost: <Ignore>
[.java] level: level
[.java] materialCost: <Ignore>
[.java] partNumber: partNumber
[.java] quantity: quantity
[.java] -----
[.java] Validating Data
[.java] Importing row 2
[.java] Importing row 3
[.java] Importing row 4
[.java] Importing row 5
[.java] Importing row 6
[.java] -----
[.java] Import Results
[.java] -----
[.java] Rows processed: 5
[.java] -----
[.java] Info: New assembly scenarios created: 2
[.java] Info: New part scenarios created: 3
[.java] -----
[.java] END BOM LOAD
[.java] -----
BUILD SUCCESSFUL
Total time: 1 minute 14 seconds
c:\aPriori14.1.1\bin>

```

Between the lines BEGIN BOM LOAD and END BOM LOAD lines are four sections:

- **Inputs** -- Contains some of the specified properties in the bomLoad.properties file (follows the same order as the BOM Load UI).
- **Mapping** – Lists the fields for the specified mapping.
- **Validating** – Records the progress of each data row import.
- **Import results** – Displays totals (similar in appearance to the BOM load UI).

If any of the required properties are not specified, an error message with the missing property name(s) is displayed in the console. An example of output for a missing `defaultScenarioName` property is shown below:

```

C:\windows\system32\cmd.exe
c:\aPriori14.1.1\bin>bomLoad C:\aPriori14.1.1\bin\bomLoad.properties
Buildfile: c:\aPriori14.1.1\install-support\antscripts\bomLoad.xml

bomLoad:
[java] -----
[java] BEGIN BOM LOAD
[java] -----
[java] ERROR: Must specify property: bomLoad.defaultScenarioName
[java] -----
[java] END BOM LOAD
[java] -----
[java]
BUILD FAILED
c:\aPriori14.1.1\install-support\antscripts\bomLoad.xml:8: The following error o
ccurred while executing this line:
c:\aPriori14.1.1\install-support\antscripts\apriori-ant.xml:73: Java returned: -
1
Total time: 6 seconds
an error occurred while running Ant
c:\aPriori14.1.1\bin>_

```

Other messages are displayed for errors such as specifying non-existing mappings or failing to supply a `rollupName` property for a functional group template.

The following screenshot shows an example of the error log file:

<user home>\aPriori\minorVersion\bomLoad-logs\apriori.log

```

Lister - [c:\Users\vkkrutas\apriori\14.1.1\logs\bomLoad-logs\apriori.log]
File Edit Options Encoding Help
2014-04-30 16:58:13,074 ERROR BomLoadMain:291 - java.lang.NullPointerException
at com.apriori.plugins.bomcostloader.HeadlessBomLoad.outputInputs(HeadlessBomLoad.java:265)
at com.apriori.plugins.bomcostloader.HeadlessBomLoad.printInputs(HeadlessBomLoad.java:217)
at com.apriori.plugins.bomcostloader.HeadlessBomLoad.doBomLoad(HeadlessBomLoad.java:190)
at com.apriori.plugins.bomcostloader.BomLoadMain.doMain(BomLoadMain.java:117)
at com.apriori.plugins.bomcostloader.BomLoadMain.doMain(BomLoadMain.java:102)
at com.apriori.plugins.bomcostloader.BomLoadMain.main(BomLoadMain.java:57)
at sun.reflect.NativeMethodAccessorImpl.invoke0(Native Method)
at sun.reflect.NativeMethodAccessorImpl.invoke(NativeMethodAccessorImpl.java:57)
at sun.reflect.DelegatingMethodAccessorImpl.invoke(DelegatingMethodAccessorImpl.java:43)
at java.lang.reflect.Method.invoke(Method.java:601)
at com.fbc.boot.FBCBoot$InvokeMainRunnable.run(FBCBoot.java:44)
at com.fbc.boot.FBCBoot.invokeMain(FBCBoot.java:316)
at com.fbc.boot.FBCBoot.doStartApriori(FBCBoot.java:285)
at com.fbc.boot.FBCBoot.init(FBCBoot.java:265)
at com.fbc.boot.FBCBoot.initInstance(FBCBoot.java:209)
at com.fbc.boot.FBCBoot.main(FBCBoot.java:158)

2014-04-30 16:58:13,074 INFO BomLoadMain:243 - -----
2014-04-30 16:58:13,075 INFO BomLoadMain:243 - END BOM LOAD
2014-04-30 16:58:13,075 INFO BomLoadMain:243 - -----

```

# 6 Wire Harness and PCBA VPEs

The separately licensed Wire Harness and PCBA Process Groups are implemented as special VPEs. This chapter covers the administration tasks associated with Wire Harness and/or PCBA VPE installation, configuration, and maintenance.

---

This chapter includes the following topics:

- Managing Wire Harness and PCBA VPEs
  - Adding or Importing User Defined Attributes
  - Importing the Wire Harness and/or PCBA VPE
  - Compiling Component Library Data
  - Maintaining the Component Library
  - Mapping BOM Loader headings
-

## Managing Wire Harness and PCBA VPEs

The separately licensed Wire Harness and PCBA Process Groups are implemented as special VPEs that must be imported and configured for your users. The components necessary to cost Wire Harnesses and PCBAs (such as VPE, UDAs, Batch File scripts, etc.) are typically not shipped with the general aPriori release. Please contact Customer Support to acquire these components.

**Note:** It is likely that aPriori Customer Support or Services will initially perform these tasks for you. Before attempting any of the procedures in this section, make sure to communicate with aPriori to check if these steps have already been performed for you.

Some configuration procedures are performed by an aPriori System Administrator, while most are handled by an aPriori VPE Administrator. Procedures for System Administrators are documented in the *System Administration Guide*. Procedures for VPE Administrators are documented below. (For end user information about Wire Harness and PCBA Costing, see the "Wire Harness Process Group" and "PCBA Process Group" chapters of the aPriori Professional *Cost Model Guide*.)

**Note:** Depending on the size of your site, the roles of System Administrator and VPE Administrator might be filled by the same person or by different individuals. Also, as mentioned above, some or all of these configuration steps may be performed by aPriori Professional Services when you purchase Wire Harness and/or PCBA Process Group functionality. If you have any questions as to what steps need to be performed, or who should perform them, please contact aPriori Customer Support.

The basic steps for configuring Wire Harness and/or PCBA Costing include:

- **System Admin:** Import or Add User Defined Attributes (see the *System Administration Guide*).
- **VPE Admin:** Import the Wire Harness and/or PCBA VPE.
- **System Admin or VPE Admin:** Define the Wire Harness and/or PCBA BOM Loader Mappings/
- **aPriori Professional Services:** WIRE HARNESS ONLY: Create XML tables for the Transformation Utility.
- **System Admin:** Install the Wire Harness and/or PCBA Costing Macro files (see the *System Administration Guide*).
- **aPriori Professional Services and/or designated employee(s) at your company:** Compile Component Library information.
- **VPE Admin:** Update the Wire Harness and/or PCBA VPE with the Component Library.

# Adding or Importing User Defined Attributes

Adding/importing User Defined Attributes (UDAs) is a task performed by the aPriori System Administrator. See the "Configuring the Wire Harness and PCBA Process Groups" chapter of the aPriori System Administration Guide for more information.

We recommend that your System Administrator add the UDAs at the same time that you perform the steps in this chapter. The UDAs *must* be added before you or your users define and map BOM Loader columns for wire harness and/or PCBA.

## Importing the Wire Harness and/or PCBA VPE

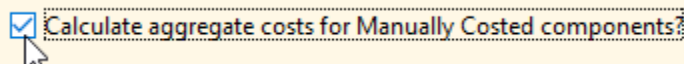
You must import the Wire Harness and/or PCBA VPE before you can begin costing.

- 1 Acquire the VPE distribution .zip file(s) and place them in an accessible folder.
- 2 Log into the aPriori client and click **Tools > VPE Toolset**.
- 3 In the aPriori VPE Toolset window, click **File > Import > VPE**.
- 4 Navigate to the directory containing your VPE distribution file, select the file, and click **Open**.

## Mapping BOM Loader headings

Before allowing your users to cost wire harnesses or PCBAs, you must configure the BOM Loader by mapping BOM column headings to aPriori fields:

- 1 Open the aPriori client and select **Tools > VPE Toolset**.
- 2 Click the **BOM Loader** icon. The BOM Loader opens and prompts you to select the file to import.
- 3 Select a wire harness or PCBA .csv data import file (NOT the component library file). For a new installation, this might be a demo file created for you by aPriori Professional Services with a name like "WIRE-HARNESS-001 - formatted.csv", delivered in a folder with a name like "Wire Harness Demo Data".
- 4 Assuming that this is the first import done on your installation, the aPriori BOM Loader prompts you to enter a mapping name. Provide a descriptive name such as "Wire\_Harness" (or "PCBA").
- 5 Ensure that this checkbox is checked in the upper-right corner.



- 6 One by one, click the aPriori Field cell for each Input File Column header and select the appropriate plain-English display name as shown in the screenshots below. (Different BOM versions may use different naming conventions, such as underscores vs spaces and initial caps.)

### Wire Harness mappings:

#### Column Mapping:

Input File Column	aPriori Field
LEVEL	Level
SCENARIO	<Ignore>
PART_NUMBER	Part Number
QTY	Quantity
MANUALLY_COSTED	Manually Costed
DESCRIPTION	Description
COMPONENT_PN	WH - Component Part Number
WIRE_GAUGE	WH - Wire Gauge
WIRE_COLOR	WH - Wire Color
WIRE_LENGTH	WH - Wire Length
BUNDLE_DIAMETER	WH - Bundle Diameter
DRESSING_LENGTH	WH - Dressing Length
SPLICE_WIRE_COUNT	WH - Splice Wire Count
TWIST_LENGTH	WH - Twist Length
TWIST_WIRE_COUNT	WH - Twist Wire Count
Preferred manufacturer	WH - Preferred Manufacturer
Preferred Supplier	WH - Preferred Supplier
Purchased Volume	WH - Purchased Volume

### PCBA mappings:

#### Column Mapping:

Input File Column	aPriori Field
Level	Level
Part Number	Part Number
Quantity	Quantity
Description	Description
Manually Costed	Manually Costed
Component PN	PCBA - Component Part Number
Material Cost	Material Cost
Unit Cost	PCBA - Unit Cost
Unit Type	PCBA - Unit Type
Purchase Date	PCBA - Purchase Date
Preferred Source	PCBA - Preferred Source
Preferred Supplier	PCBA - Preferred Supplier
Preferred Manufacturer	PCBA - Preferred Manufacturer
Pin Count	PCBA - Pin Count
Mount Type	PCBA - Mount Type
Purchase Volume	PCBA - Purchase Volume

- 7 Click the **Save Changes** icon in the upper-left corner when done.

## Creating Wire Harness XML tables

This is a step that is performed by aPriori Professional Services, and which is used only for Wire Harness, not PCBA. Because different Wire Harness tools generate data in different forms, aPriori Professional Services may provide you with customized XML files that the Transformation Utility uses to convert your data properly. This section is included only so that you are aware of work that occurs behind the scenes for your Wire Harness installation.

## Compiling Component Library Data

The aPriori Wire Harness and PCBA VPEs come with an empty Component Library that needs to be populated with current data applicable to your installation. This Component Library serves as a cross-reference between your company's approved parts list for wire harness or PCBA design (typically using internal part numbers) and manufacturer and supplier part numbers along with information such as current cost, life cycle status, etc.

There are at least a couple of ways that this data can be compiled:

- Your company may already maintain this information. If so, you can format it and import it into aPriori.
- Your company may maintain only an approved parts list but have a preferred method of acquiring corresponding manufacturer and supplier data, and pricing information for individual components. In this case, you need to compile the data using your company's preferred process, then format it and import it into aPriori.
- Your company may maintain only an approved parts list but does not have any preferred or established process for acquiring corresponding manufacturer and supplier data, and pricing information for individual components. In this case, you can work with third-party aPriori partner such as Ciiva to acquire real-time pricing and availability information from a wide range of different suppliers. As above, you then format the output from the third-party and import it into aPriori.

**Note:** This initial set-up procedure needs to be done only once. You can periodically revisit this procedure to update your information as needed. If you are not sure whether or not you need to go through this procedure, contact your Professional Services representative.

### If your company provides or compiles the Component Library data

If your company already has (or will compile) data that cross-references its approved parts list to manufacturer or supplier part numbers and other information like costs and availability, you need to format that data in a table format that can be imported into Microsoft Excel (which aPriori uses to import and export Component Library data). Use the same general formatting rules that are used to update aPriori Component Library data, as described in [To update the Component Library lookup tables](#).



## If you use a third-party to compile the Component Library data

Third parties such as Ciiva provide real-time pricing and availability information from a wide range of different suppliers. You then upload your wire harness or PCBA data (consisting of your approved parts list and their corresponding manufacturer and manufacturer part numbers) so that the third-party can return costing information that you then use to populate or update your aPriori Component Library.

**Note:** In general, you should use the documentation provided by the third-party and/or aPriori Professional Services. However, the general example below based on one third-party gives you an idea of what to expect. Further note that you will need to map third-party and aPriori terminology to each other. For example, in Ciiva a "Product" will typically map to an aPriori "part number".

- 1 Whenever your company adds new part numbers, log into the third-party application and create/add new components. This typically involves entering the name of your wire harness or PCBA and a version number.
- 2 Upload your company data. You need to prepare a ".csv" file which is based on your company-approved parts list and which at a minimum contains columns for:
  - Base Component Part Number Attribute (internal part number)
  - Manufacturer Component Name Attribute
  - Manufacturer Component Part Number Attribute

Depending on the third party, you may be able to do things like create a Bill of Materials on import, by adding an additional copy of the Base Component Part Number Attribute for use as the Designator Attribute. You may also specify the Quantity Attribute for each part number. You may also add an extra column to designate the Class for new component parts in the third party. aPriori uses this attribute to define the name of the customer for which the particular database is set up. If no column is added, you have the option to allow for empty class attributes and designate a default value.

Once the .csv file is prepared, upload it to the third party.

- 3 Map the fields from the spreadsheet to the third-party fields.

**Note:** aPriori terms may not be the same as third party terms. For example, in Ciiva, the "Class" attribute should be the customer name, but in aPriori wire harness terms, "Class" refers to the high-level designation of what the part is (i.e., wire, terminal, connector, etc.)

- 4 Complete the import.
- 5 Search, add, and confirm supplier parts.

**Note:** You will need to repeat this periodically to update costing data.

Depending on the third party and your requirements, you may need to perform other steps such as updating lifecycle status, syncing components, etc.

- 6 Obtain pricing Information.

- 7 Export and format component data for import into aPriori, typically through an **Export to CSV** operation. Give it a descriptive name like “aPriori Component Library WH.csv”

## Updating the Component Library

The basic steps for updating your wire harness or PCBA Component Library include:


- Make a backup copy of your wire harness and/or PCBA VPE.
- Export the Component Library lookup tables from your VPE to Excel.
- Update the componentLibrary table in both of your process groups (Assembly and User Guided) with current data.
- Re-import the updated Component Library lookup tables

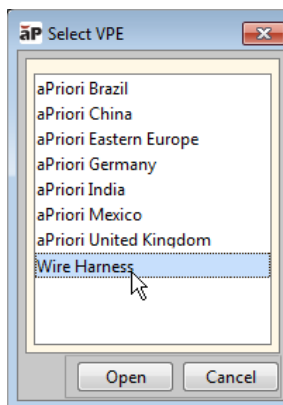
### To back up your wire harness or PCBA VPE

Use the VPE Export feature to make a copy of your VPE before performing the procedures in this section. See [VPE Export operations](#) for details.

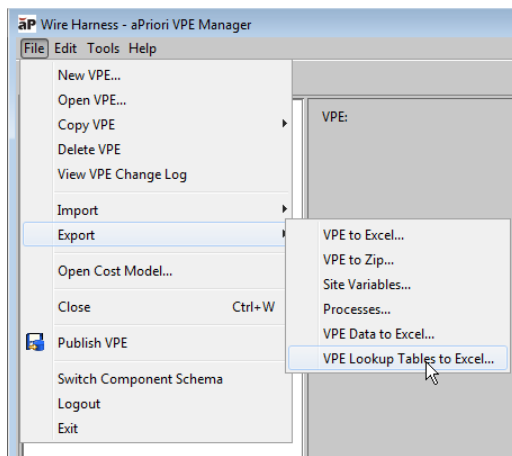
### To export the Component Library lookup tables

This procedure assumes that you are updating your Component Library with output from a third party like Ciiva. Adjust the procedure as necessary to reflect your actual situation.

- 1 In the aPriori client, click **Tools > VPE Toolset**.
- 2 In the resulting **aPriori VPE Toolset** window, click the **VPE Manager** icon () , then select the wire harness or PCBA VPE from the **Select VPE** window. For this example, the VPE is named **Wire Harness**; yours may have a custom name, or you may be exporting the PCBA VPE. Click **Open**.

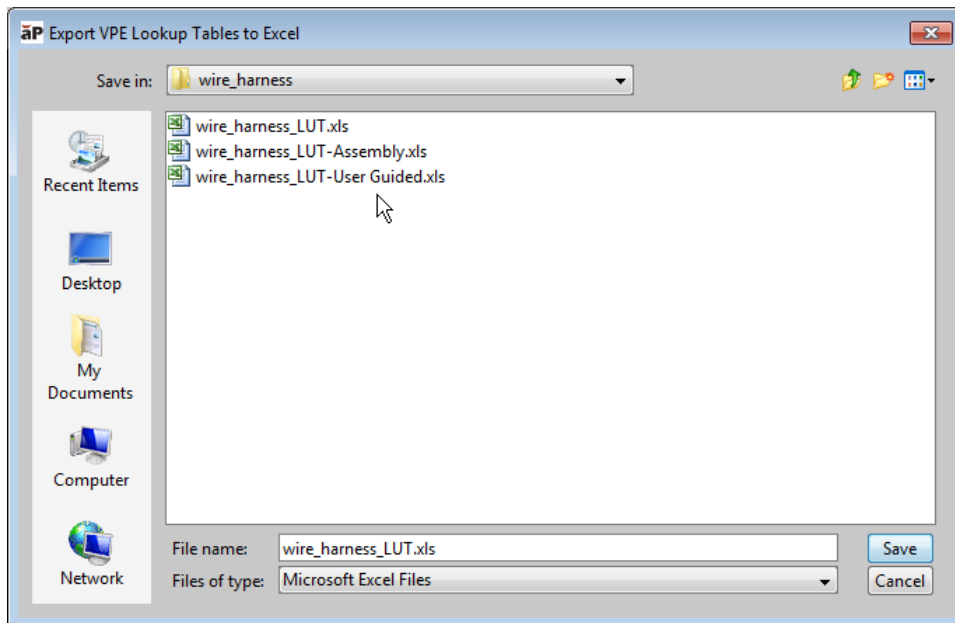


- 3 In the resulting **aPriori VPE Manager** window, click **File > Export > VPE Lookup tables to Excel**.



- 4 Specify a name (for this example, "wire\_harness\_LUT" or "PCBA\_LUT") and click **Okay**.

This creates an Excel file for every process group in the VPE, as well as an "index" spreadsheet for all of the other sheets created by the export. In the case of the Wire Harness and PCBA VPEs, there are only two process groups that generate Excel files: Assembly and User Guided. TAKE NOTE OF THE FOLDER WHERE THE SPREADSHEET IS BEING SAVED.



### To update the Component Library lookup tables

**Note:** It is important that you update both the Assembly *and* User Guided process groups.

- 1 in Excel, open the source file that contains the data you wish to import into your component library. (In the example in the previous section, this was the output file from a third party and was named "aPriori Component Library WH.csv".)
- 2 Open the exported lookup table file for the Assembly process group. (In the example in the previous step, this was named "wire\_harness\_LUT-Assembly.xls".)

### 3 Click on the componentLibrary sheet.

	A	B	C	D	E	F	G	H	I	J	K	L
1	Allowance (s)	Weight (kg)										
2	11.5	25										
3	2.2	1.5										
4	1.1	0										
5	14.4	50										
6	6.5	8										
7	115.2	999999999										
8	7.6	15										
9	115.2	100										
10												
11												
12												
13												
14												
15												
16												

### 4 Ensure that the columns in the import file spreadsheet match the columns in the lookup table spreadsheet exactly. If not, . Modify (or regenerate) the import file so that they do.

	A	B	C	D	E	F	G	H	I	J
1	CUST_PN	MFG	MFG_PN	SUPPLIER	SUPPLIER_PN	CLASS	TYPE	SUBTYPE	LEAD_TIME (days)	LIFECYCLE STATUS

	A	B	C	D	E	F	G	H	I	J
1	PN	MFG	MFG_PN	SUPPLIER	SUPPLIER_PCLASS	TYPE	SUBTYPE	LEAD_TIME	LIFECYCLE	

**Note:** When you need to remove rows when editing a lookup table spreadsheet, it is critical that you do not leave empty rows. If you select one or more rows and press the **Delete** key, you remove the contents of the cells but leave the empty rows in place. This will cause problems when you import the spreadsheet into aPriori. Therefore, use the right-mouse-click **Delete** option, and ensure that the rows are removed as well as their content.

- Carefully copy the cells from the import spreadsheet and paste them into the corresponding cells in the Assembly componentLibrary sheet. If you are *replacing* all the information in your Component Library, make sure that no old data remains in the target spreadsheet after the **Paste**. If you are *adding* new information, make sure that you do not overwrite data that you wish to keep.
- You must update the User Guided exported file with the same information. You could simply repeat the previous three steps, but a more efficient method would be to use the Excel Copy command: open the User Guided workbook, delete the componentLibrary tab, then copy the updated tab from the Assembly workbook into User Guided.

**Note:** It is important that you update the componentLibrary for both Assembly *and* User Guided.


- 7 Save and close both files when they have been successfully updated with the data from the import file.

### To reimport the Component Library tables

To re-import the Component Library tables:

- 1 Return to the VPE Manager and click **File > Import > VPE Lookup tables from Excel**.
- 2 Navigate to and click only the index Excel file. (This is the one *without* a process group embedded in its name; in this example, "wire\_harness\_LUT.xls".)
- 3 Click **Open**.

**Note:** If aPriori displays an error message when you try to import, double-check that you have not selected one of the process group files or another incorrect spreadsheet. You **MUST** select the index spreadsheet.

- 4 If replacing existing data with updated data, specify **Replace**. If you are adding data about new components, specify **Add** to existing data.
- 5 Optional: Enter a comment for a log entry describing the update.
- 6 Click the **Publish VPE** icon (  ) when done.

If you are updating the component library for both Wire Harness and PCBA, you must repeat this entire process for the other VPE.

## Maintaining the Component Library

You should plan to update your Component Library on a regular schedule to keep your data current.

On a frequent basis (perhaps weekly, or on-demand) you will need to add new components as they are added to your company's approved parts list.

On a less frequent basis (perhaps quarterly or annually), update all components with current information.

Consult aPriori Professional Services about a schedule and process that makes sense for your installation.

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