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Managing Your Properties with Vault Professional

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Learning Objectives

- Learn where to find properties in Vault
- Learn the difference between system and user defined properties
- Learn how to map properties to and from your CAD files
- Learn how to display the values of mapped properties

Description

This class will look at properties in Vault Professional, both System and User Defined. Where to access them, how to create mappings to your CAD files, and how to use that information in Vault or on your CAD files themselves.

Speaker(s)

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I have been working as a mechanical designer and drafter for more than 20 years, using Autodesk, Inc., products for most of that time. I was inducted in the first class of Autodesk Expert Elites for my activity on the Autodesk discussion forums and social media, and for my CAD Tips, Tricks & Workarounds blog. I've spoken at Autodesk University 4 times, including a trip to Moscow in 2014 to speak at AU Russia. My specialties are Inventor Tube & Pipe and Frame Generator, Content Center, and Vault Professional.

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Mike spent the first part of his career in the Autodesk channel working for an Autodesk reseller as an Application Specialist. During his travels, he delivered countless hours of training, support, demos, and implementations. He was very fortunate to be able to help solve many issues with Autodesk software. Data Management has always been a big part of his professional life. Now he is the Technical Services Manager at Prairie Machine & Parts Mfg (www.pmparts.com) a mining equipment manufacturer. His primary duties include the ongoing support of critical computer systems and programs and the interactions between departments.

About Vault Properties

Properties in Vault are attributes that are associated with a file, for collecting or populating metadata. System defined properties are those defined by the Vault, while User Defined Properties (UDPs) are defined by a user with Administrative privileges in the Vault. The following can be found in the [product documentation](#) on this topic, but I am placing it here as well for easy reference in the future.

Common Terms

Term	Definition
Associations	Attribute that determines whether the property is associated with a file, an item, or a change order.
Compliant	The status of a property that meets all property policies and equivalence evaluations.
Data Type	The type of data accepted for the property value. This type can be text, number, boolean, or date.
Database Property	Any property in the database, either user defined or system.
Entity	An entity is the system class with which a file can be associated. Entities are files, items, or change orders.
Equivalent	The status of a mapped property when its value matches the source value.
File Property	A property associated with a file.
Mapped Property	A property from which the property being defined gets its value. For example, a UDP can get its value from several different file properties. A file property can get its value from a system property.
Mapping	A set of relationships between the property being defined and a property from which it receives its value. There can be multiple mappings for a given property definition.
Master	The property from which a mapped property gets its value. The master property writes its value to the subordinate property.
Non-compliant	The status of a property when it has failed to meet one or more property policies or its equivalence evaluation.
Non-equivalent	The status of a mapped property when its value does not match the source value.

Common Terms cont.

Property Definition	All attributes and constraints about the property including its name, data type, initial value, mapping, minimum and maximum values, case values, in-use value, and basic search value.
Property Name	The name used in the GUI (graphical user interface) to identify the property.
Property Policy	Depending on the data type, the property policy specifies certain constraints that must be met. The constraints may include a value range, a value type, or a value format must be met. For example, a property policy might be described as follows: the property must have a value and that value must be in the range of 1 to 10. When a property fails to meet its property policies, it is considered non-compliant.
Property Value	The literal content of a property attribute for a specific file version.
Override	Determines whether the property value is over-ridden by the policy defined by its category.
Subordinate	The mapped property that receives its value from the master property.
System-Defined Property	A property in the database created by the system, which is then assigned to a file.
User-Defined Property (UDP)	A property in the database created by an administrator. The property can be applied to a file when it is added to a vault.

Data Types

Every property value has a data type that determines how that value is read and processed.

Data Type Name	Description
Boolean	True or False.
Date Type	Can be a specific date or date range expressed by a beginning and end date.
Number	Numbers only.
Text	Letters and numbers.

Attributes

Properties have attributes that determine how the property is described and the constraints for its value.

Attribute Name	Description
Basic Search	A constraint that determines whether or not the property should be included in basic searches.
Case Sensitivity	A constraint that applies to text data types. This constraint can be set to none, UPPER CASE, lower case, Name Case or Sentence case.
Enforce List of Values	A constraint that determines whether the property must have a value from a list.
Initial Value	An attribute that specifies the initial property value when one isn't specified. Note: Initial values are best used with write mappings. If an initial value is set on a regular read mapping, that read mapping has higher priority and will overwrite the initial value. The only case in which an initial value won't be overwritten by a read mapping is if the value it maps to is blank.
List Values	Displays the List Type dialog box from which you can enter and order values for a list. At least one item must appear in the list.
Minimum Length	The minimum number of characters a property value can have.
Maximum Length	The maximum number of characters a property value can have.
Requires Value	A constraint which determines whether the property must have a value to be compliant.
State	A setting on a property that indicates whether it recognizes the state the file in a lifecycle.
Usage	Indicates the number of files currently using the property. Use this information to determine which properties are used more than others, to help decide which properties can be removed from the vault.

Property Compliance Icons

The main view in the vault client has a Property Compliance column that lists various status icons. The Icons in this column indicate whether a property associated with the file is compliant, non-compliant, pending, or has failed the equivalence evaluation.





Icon	Value	Definition
No icon	Compliant	All properties meet policy requirements and equivalence.
	Non-compliant	One or more properties do not meet property policy requirements or equivalence. Hover your mouse over the icon to learn more about why one or more properties failed compliance.
	Not calculated	There has been a change to one or more properties but equivalence and policy have not been verified yet.
	Pending	Properties are currently being evaluated for equivalence.
	Evaluation failed.	The equivalence evaluation failed. This is a rare situation and can result when the processor enters an evaluation loop. Note: On the Find dialog, an evaluation failed value is added. This allows you to search for any files for which the evaluation failed.

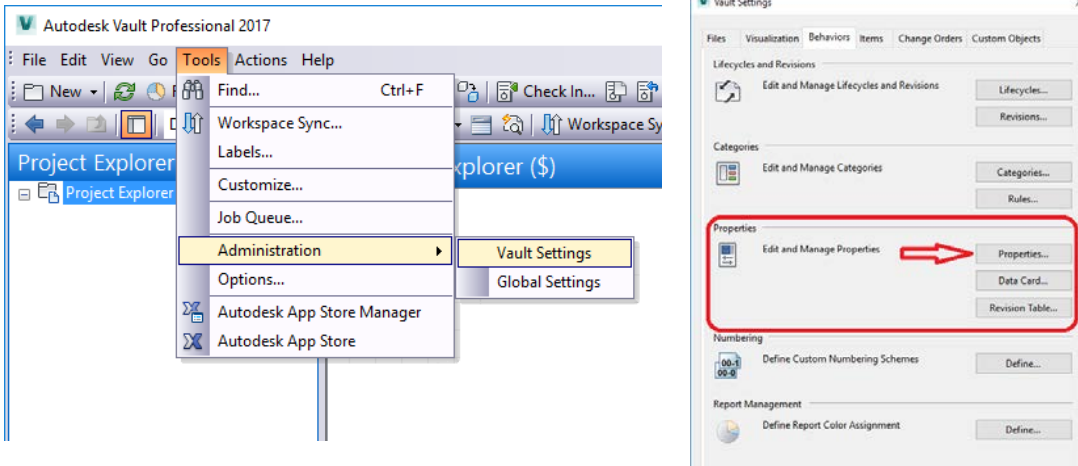
Figure 1

Properties Management – Administrator

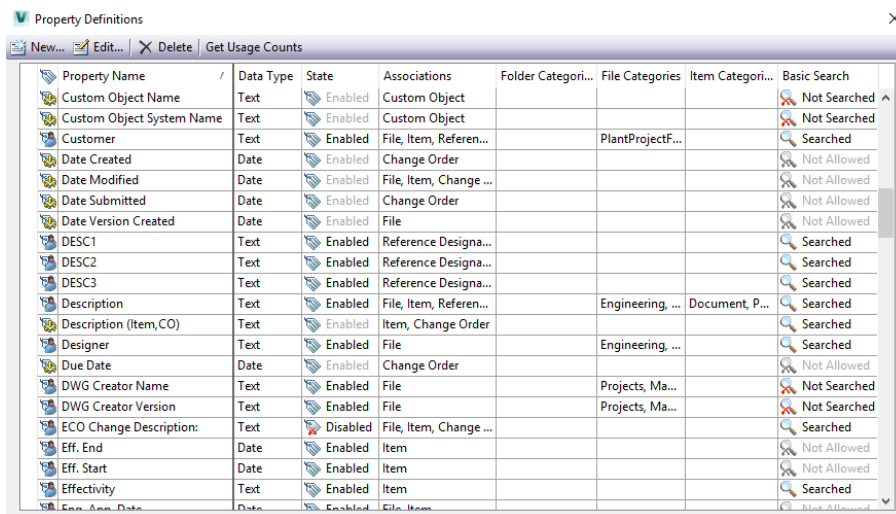
In this section, we will discuss the tasks for creating and managing properties in Vault Client. You must have administrative privileges to perform the tasks discussed in this section.

Accessing Property Definitions

To access the property definitions in Vault, a user with admin privileges can select Tools from the top menu bar, then Administration\Vault Settings and finally Behaviors. This is shown in the next two images.




The grid which opens contains all the tools needed to create or manage properties. As with most tables in Windows based programs, you can fully customize the contents of this grid by right clicking on a column header and selecting Customize View. This will allow you to add or remove columns as you see fit. Columns can be rearranged by dragging-and-dropping the column header to the desired location. Columns can also be removed by selecting the header, holding the mouse button, and dragging downward until an “X” appears in the column header, indicating it will be removed.



Property Name	Data Type	State	Associations	Folder Categories	File Categories	Item Categories	Basic Search
Custom Object Name	Text	Enabled	Custom Object				Not Searched
Custom Object System Name	Text	Enabled	Custom Object				Not Searched
Customer	Text	Enabled	File, Item, Referen...		PlantProjectF...		Searched
Date Created	Date	Enabled	Change Order				Not Allowed
Date Modified	Date	Enabled	File, Item, Change ...				Not Allowed
Date Submitted	Date	Enabled	Change Order				Not Allowed
Date Version Created	Date	Enabled	File				Not Allowed
DESC1	Text	Enabled	Reference Designa...				Searched
DESC2	Text	Enabled	Reference Designa...				Searched
DESC3	Text	Enabled	Reference Designa...				Searched
Description	Text	Enabled	File, Item, Referen...		Engineering, ...	Document, P...	Searched
Description (Item,CO)	Text	Enabled	Item, Change Order				Searched
Designer	Text	Enabled	File		Engineering, ...		Searched
Due Date	Date	Enabled	Change Order				Not Allowed
DWG Creator Name	Text	Enabled	File		Projects, Ma...		Not Searched
DWG Creator Version	Text	Enabled	File		Projects, Ma...		Not Searched
ECO Change Description:	Text	Disabled	File, Item, Change ...				Searched
Eff. End	Date	Enabled	Item				Not Allowed
Eff. Start	Date	Enabled	Item				Not Allowed
Effectivity	Text	Enabled	Item				Searched
Exp. App. Date	Date	Enabled	File, Item				Not Allowed

Note the Icons next to the Property Name column. These indicate whether the property is System or User defined.

 Indicates a System Defined Property.

 Indicates a User Defined Property.

Creating a New User Defined Property

When creating a new user Defined Property, think about how and where you want to use the property and the associated data. In Property Definitions, select the “New” button to open a dialog for filling out all the necessary information to create your new property. Give it a name that will be easily recognizable and searchable in the future.

Select the Data Type that will be assigned to this property, and check all appropriate Associations to Files, Items, Folders etc. The available associations will vary depending on the version of Vault.

Under Settings, ensure that the property is Enabled. Disabling a property will prevent it from being indexed by Vault. This may be used to “shut off” properties that are in use on files, but are no longer needed. If a property is in use anywhere in the Vault, it cannot be deleted.

Also in Settings:

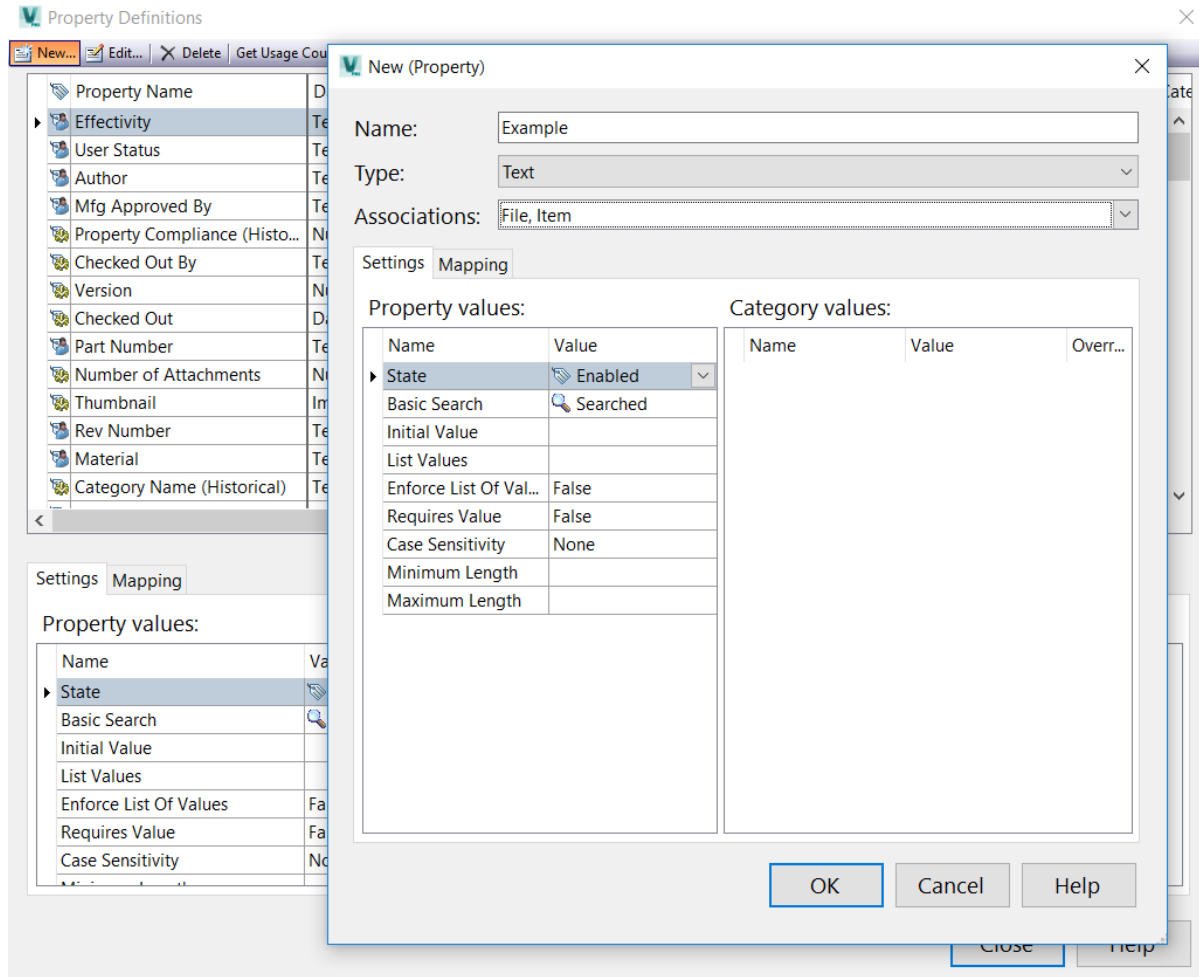
- Basic Search: to determine if the property is searchable.
- Initial Value: Used to set a default value for the property.
- List Values: Used to create a selectable list of possible values.
- Enforce List of Values: Determines whether the value **must** be from the list above.
- Requires Value: Sets whether the property can be empty or not.
- Case Sensitivity: Sets the default case, if any, for the value.
- Minimum and Maximum Length: Sets any limits on the number of characters allowed in the value.

The below image illustrates what will be seen in the Properties Grid when the value of a property violates one of the above settings. In this example the Maximum Length of the value was set to 12 characters, and the value entered was longer.

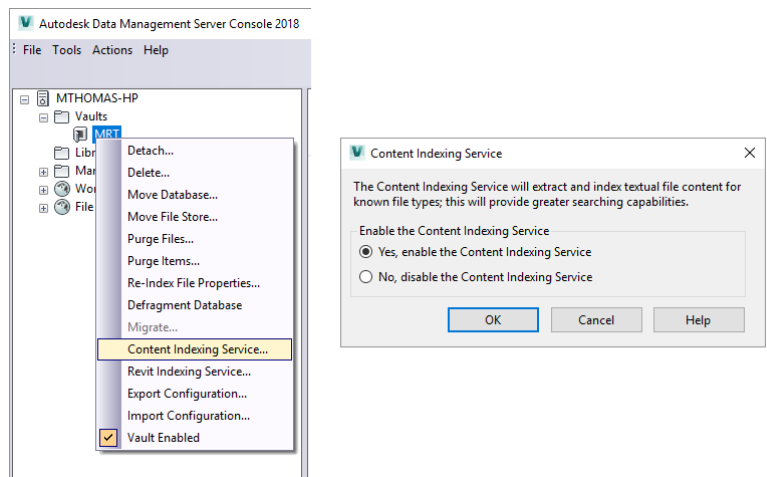
User Defined	
Author	cbenner
Category	Powell Project Files
Checked By	
Checked By Date	
City	
Comments	
Company	
Cost	
Description	L 300 x 200 x 025
Designer	cbenner
DWG Creator Name	
DWG Creator Version	
Eng. Approved Date	
Engineer	
File_Name	
Length	123456789101112131415
Manager	
Material	
Mfg. Approval Date	

❗ Policy Error
Maximum number of characters allowed is '12'.

Once these settings are completed, you may go directly to Mapping on the property or select the OK button to create the property and then return to Mapping later.



Not property related, but expand Vault's search with **Full Content Searches**. This allows users to search the Vault for words inside documents (Excel, Word and Power Point are accessible by default for full content searches). This option is enabled from the Autodesk Vault Data Management Server (ADMS).

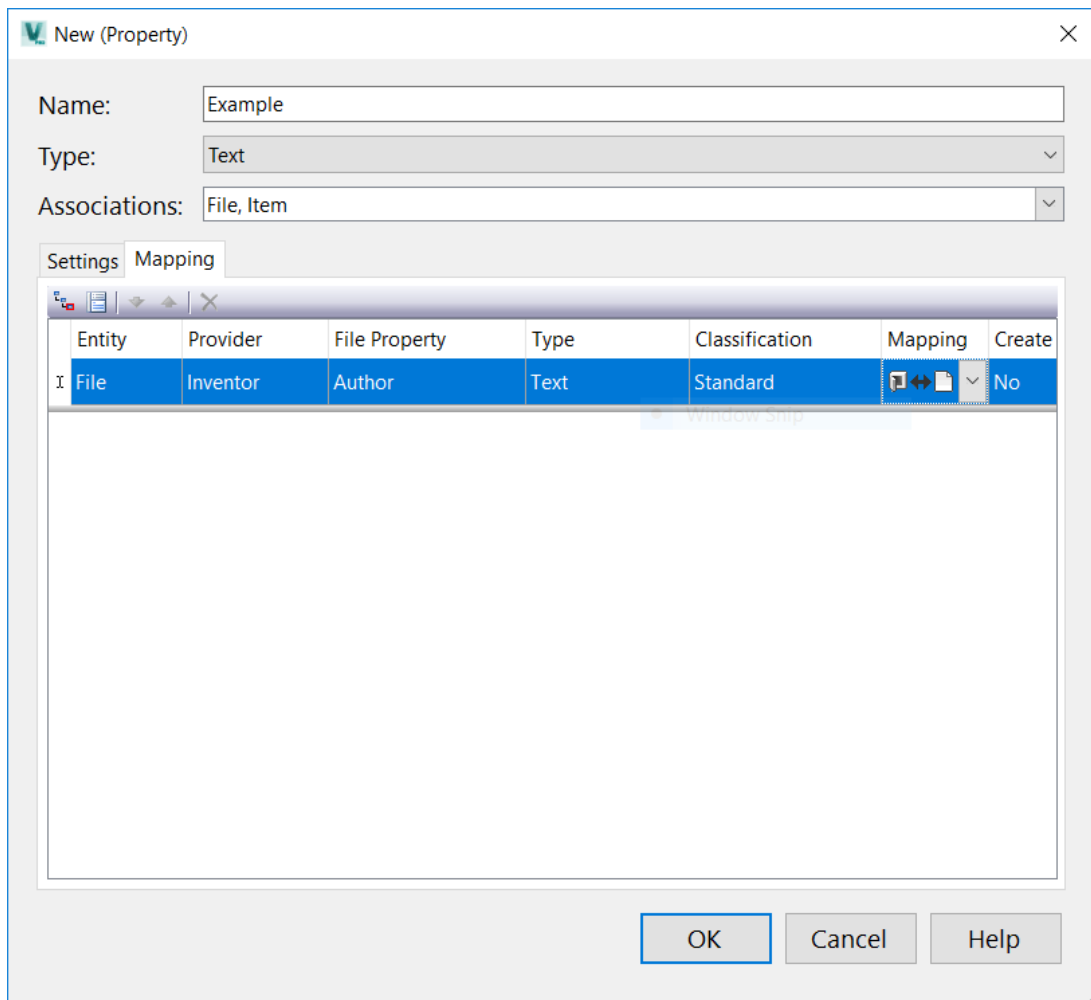


Mapping Properties

Mapping a property to a file can be thought of as either pushing a value to a file, or pulling a value from a file, or both. An example may be a user defined property you have created in vault, where you want the value to be set by the user in Vault client, and then pushed to an Inventor file to populate an iproperty field. The property can also be mapped so that the user enters a value for the iproperty on the CAD file, and the value gets pulled into the Vault property, when the file is checked in.

To map a property in Vault to a CAD file, there needs to be an available property both in the Vault, and on a CAD file. On the CAD file, you can create a custom property if needed, or use an existing system property.

On the new (or existing) Property dialog, select the Mapping tab. Select “Click Here to add new mapping”. Refer to the image below:



Entity refers to what you want to map this property to/from. Your options are File or Item. You may have multiple mappings on a property so you can map to both files and items, but they must be mapped separately.




Once the Entity type is selected, **Provider** will display a list of available options for that Entity type. The provider will be the document type that you want to map the property to/from. These can be CAD files such as AutoCAD or Inventor drawings and models, Office Documents, Revit models, etc.

File Property options will depend on the Entity type as well. If you chose File, you will be able to select a file property either from your file system or from within the Vault. If you chose Item, your only option will be to map to a file that exists in the Vault. The file chosen in this step may be any file that meets the criteria, but the property you are mapping to/from must already exist on whatever you choose. In the example above I have used Author, which is an existing property on most file types. If you want to map to a custom property, you first need to create this property on a file of the appropriate type, and save it. In the case of an Item mapping, this file must also be checked into the Vault.

Type will generally be set for you based on the property you have selected in the last column. It will be based on the type of data associated with the File Property, such as Text, Date, Number etc.

Classification will denote whether the File Property is a Standard Property or a Custom Property.

Mapping tells the Vault how to push/pull the data being shared between the Vault Property and the File Property. Your options are:

- Vault to File 
- File to Vault 
- Bi-directional 

Some Vault system properties will only allow you to map in one direction or the other, but not both. Plan this section carefully because it will determine where you enter the value for the property. Either enter the value in the Vault and push it to the file, or enter it on the file and send the data to the Vault.

Create determines whether the Vault will create the property on the file if it does not already exist. If your mapping direction is File to Vault, this option will be set to No, as properties in the Vault cannot be created in this fashion.

Once a property mapping is fully created, most of the sections cannot be changed. Only Mapping & Create will be editable. If you find you need to make major changes to a mapping, you may need to delete it and create a new one.

Enabling Searches of Attributed Blocks of DWGs within Vault

To map the values of block attributes contained within your AutoCAD drawings, you must first set the blocks for indexing. Complete this within the ADMS.

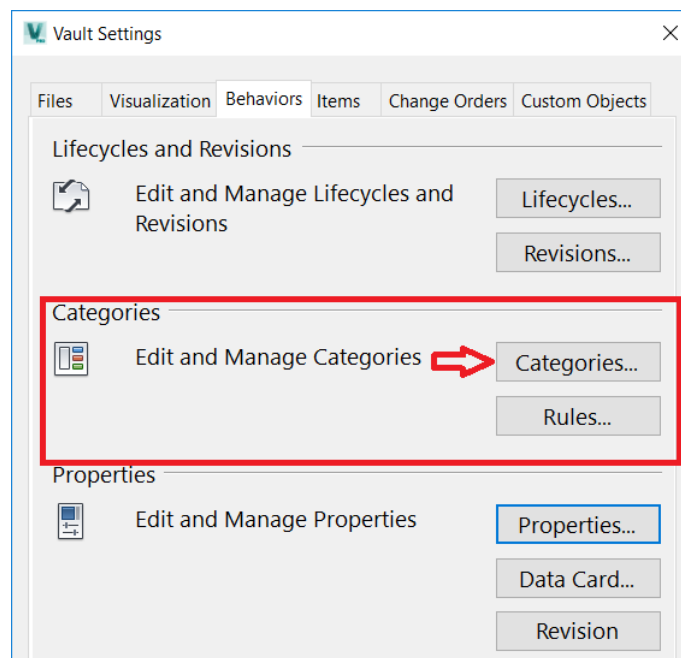
1. Within the **ADMS** select the Vault containing the attributed blocks
2. Select Tools > **Index Block Attributes...**
3. Within the Index Block Attributes dialog select **New**. Enter the name of the attributed block for attribute extraction. The name is case sensitive.
4. Optionally enable the option to extract the attribute prompt instead of the tag.

If drawings exist within your Vault that contain the attributed block a re-index will be required. The re-index extracts the information, making it searchable and available to your properties.

1. With the Vault selected within the ADMS, choose Actions > **Re-index Properties**

Assigning Properties to Files or Items

Properties may be assigned to Files, Items, Folders, or Custom Objects in Vault, by Category, to make them easier to find and edit the Values. This is done through the Configure Categories tool. Under Tools\Administration\Vault Settings\Behaviors, Select Categories next to Edit and Manage Categories.



In the Categories window, select the type of Category you want to assign properties to. In the lower pane, under Behaviors, select the Properties Tab and Assign. A list of Available Property Definitions opens on the left, with Assigned Property Definitions on the right. Select a property from the left, and click Add to assign it. Select a property on the right and click Remove, to delete the property assignment for that Category.

Configure Categories

Item Categories | New... | Copy... | Edit... | Delete | Set Default

...	<input type="checkbox"/>	Category Name	Description
	<input checked="" type="checkbox"/>	Powell Manufactured Part	Powell Manufactured Part
	<input type="checkbox"/>	Powell Manufactured Part Drawing	Powell Manufactured Part Drawing
▶	<input checked="" type="checkbox"/>	Powell Project Files	Powell Highly Engineered Project Files
	<input type="checkbox"/>	Powell Purchased Part Drawing	Powell Purchased Part Drawing
	<input type="checkbox"/>	Powell Standard Equipment	Powell Standard Equipment
	<input type="checkbox"/>	Purchased	Purchased

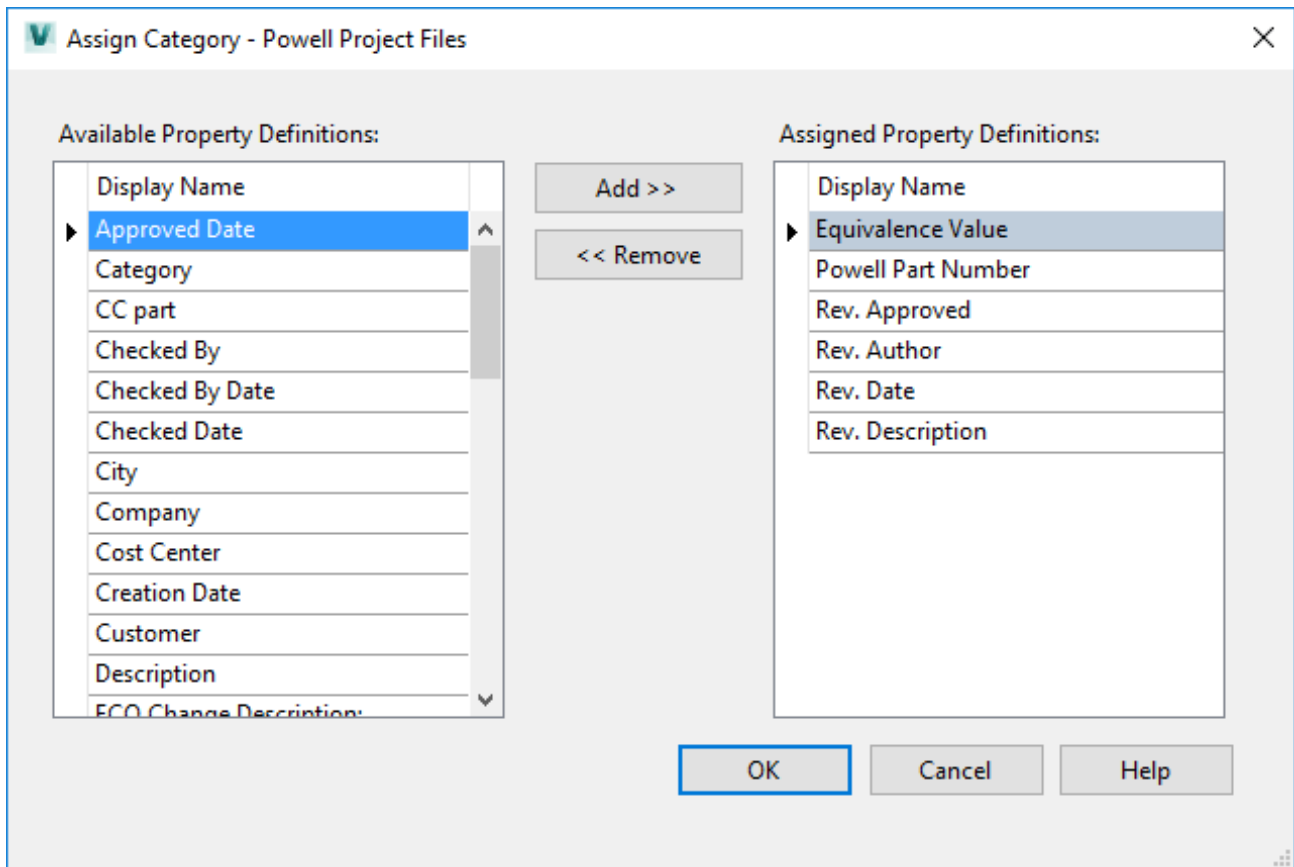
Behaviors

Lifecycles | Revisions | Properties

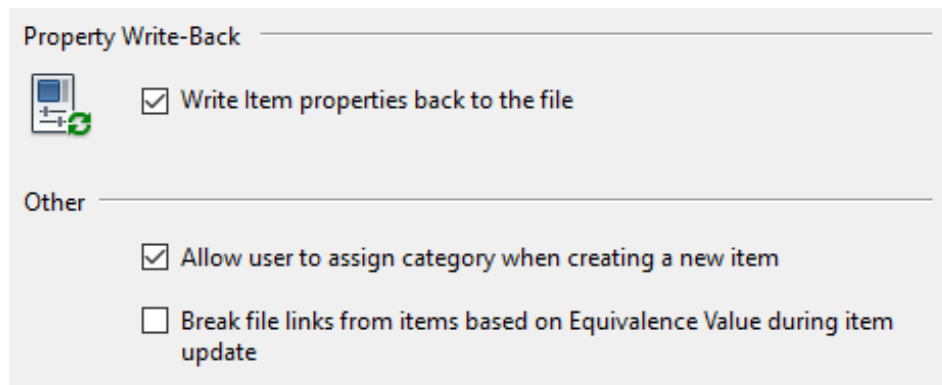
Edit... | Assign...

Display Name	Initial Value	Data Type
▶ Equivalence Value	<Mapped>	Text
Powell Part Number		Text
Rev. Approved		Text
Rev. Author		Text
Rev. Date		Date
Rev. Description		Text

Close Help



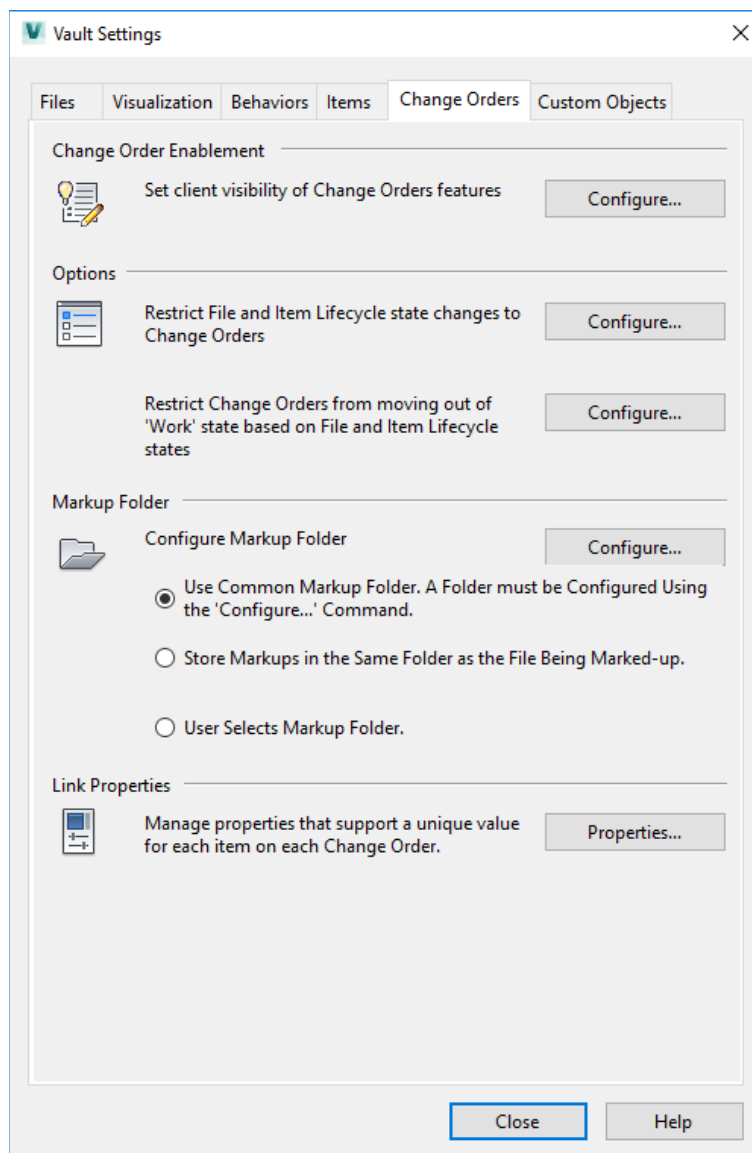
It should be noted here that Properties assigned to Items will take precedence over the associated files. If the value of a property on a file is modified and the properties are synchronized, the value of that property on the Item will over write the File property value. If you want to avoid this, uncheck the **Write Item properties back to the file** button on the Items tab under Tools\Administration\Vault Settings.



Assigning Properties to Change Orders

There are 2 different types of property assignments involved with Change Orders. The first involves properties assigned to a Change Order as a whole. These include several System Properties assigned out of the box by default, Such as Submitted by, which is set to the Vault or Domain user name of the change order originator. Other properties, including user defined properties may be added to the change order by simply setting the property associations to include Change Order, in the Property Definitions window. These will then appear on the “General” tab of the change order, and can be edited based on the settings for that individual property.

You can also set specific properties to change orders that will allow a unique value for each Record on the change order. An example might be an “Assigned To” property, to allow those viewing the change order to see who is working on each part of the task. These are set by going to Tools\Administration\Vault Settings\Change Orders, and selecting the Properties button under Link Properties.

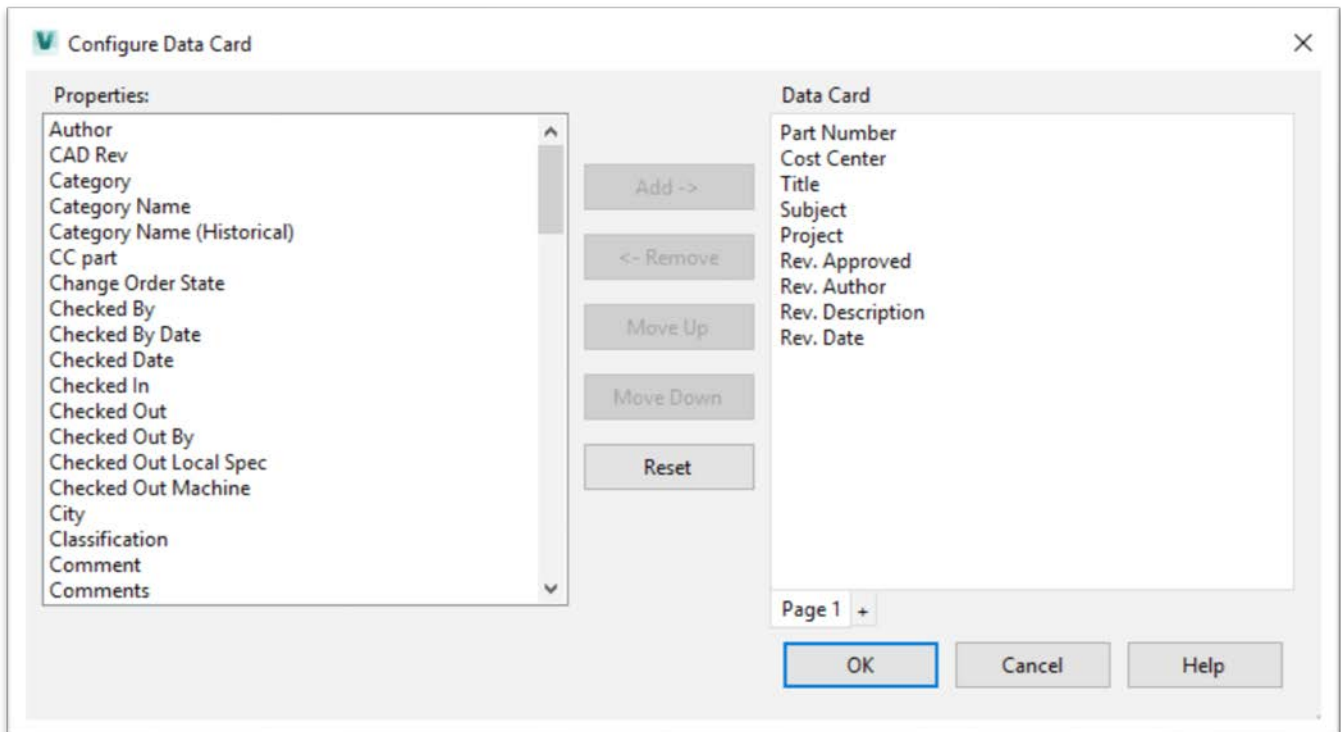


BOM Row Properties

If you are using the Vault Professional Item Master and managing your Bills of Materials (BOM) in Vault, you can create properties for BOM rows that are mapped to properties on your files. This is done in much the same way as creating and mapping any other User Defined Property. The association set on the property must be set to Bill of Material Row, and may not be associated with any other type. Once the property is created and mapped to a file property, it can be added to your BOM by right mouse clicking on any column header and selecting Customize View, and then adding the new property from the list of available fields. The value can be entered on any row in the BOM except for the root row. These properties will then be pushed out to the CAD files when they are opened and properties updated.

Configuring Inventor Data Cards

Vault Data Cards can be set up for use in Inventor, to bring several properties into one place for easy viewing and editing inside Inventor. The Vault administrator can configure the data cards by going to Tools\Administration\Vault Settings\Data Cards. In the dialog that opens, you can create as many tabs as are needed. Properties are added to a tab by first selecting the tab, and then selecting properties from the list on the left, and clicking Add. The properties may be moved up or down on the tab as needed. Tabs may be renamed by double clicking. When finished editing, select the OK button to save and close the dialog. The reset button, if selected, will revert a data card to the last saved version.

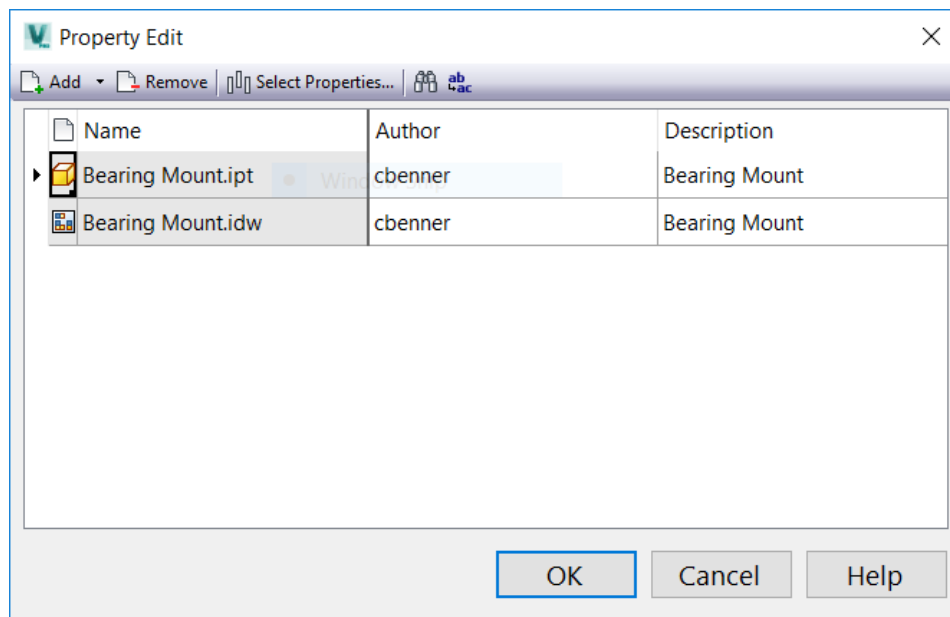


Property Management – Client

The Edit Properties command allows users to edit the values of Properties on Files, Items, Folders, Change Orders and Custom Objects in Vault Professional. In this section, we will look at several methods of doing this.

Edit Properties in Client Main View

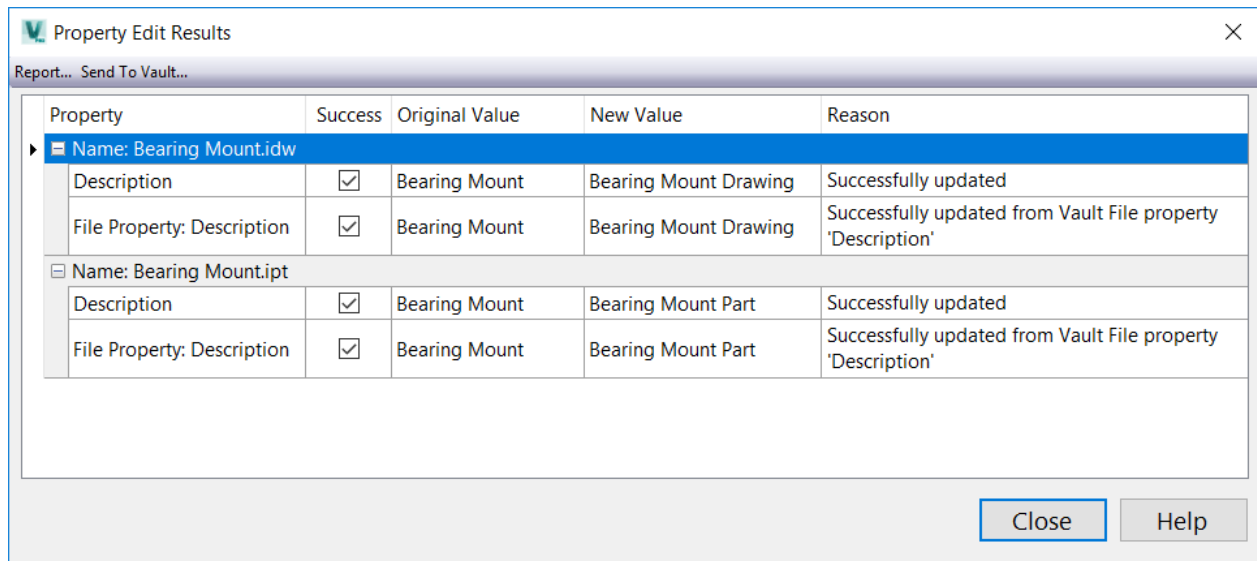
User must have Admin or Editor roles assigned to be able to edit properties in the main view. Check with your Admin to see if you have the appropriate roles assigned. From the main view in Vault, select a file or group of Files, Items, Change Orders, Folders, or Custom Objects. With these selected press Ctrl E, or go to Edit\Edit Properties.



By default, the above properties will be shown on your selection. Add or remove files using the Add and Remove buttons on the menu. Select Properties allows you to add available property definitions to the editing grid. There are also buttons for search, and Find/Replace. These can assist in finding values in a large list of files, and for replacing common values with a new value.

Double click a value to edit it. Right click to copy and/or paste a value. Select a single cell whose value you want to use in multiple files, pick the small black square that appears in the lower right corner of the cell and drag to place that value into multiple cells at one time. For example, to change the Author name of an entire group of files to the top value.

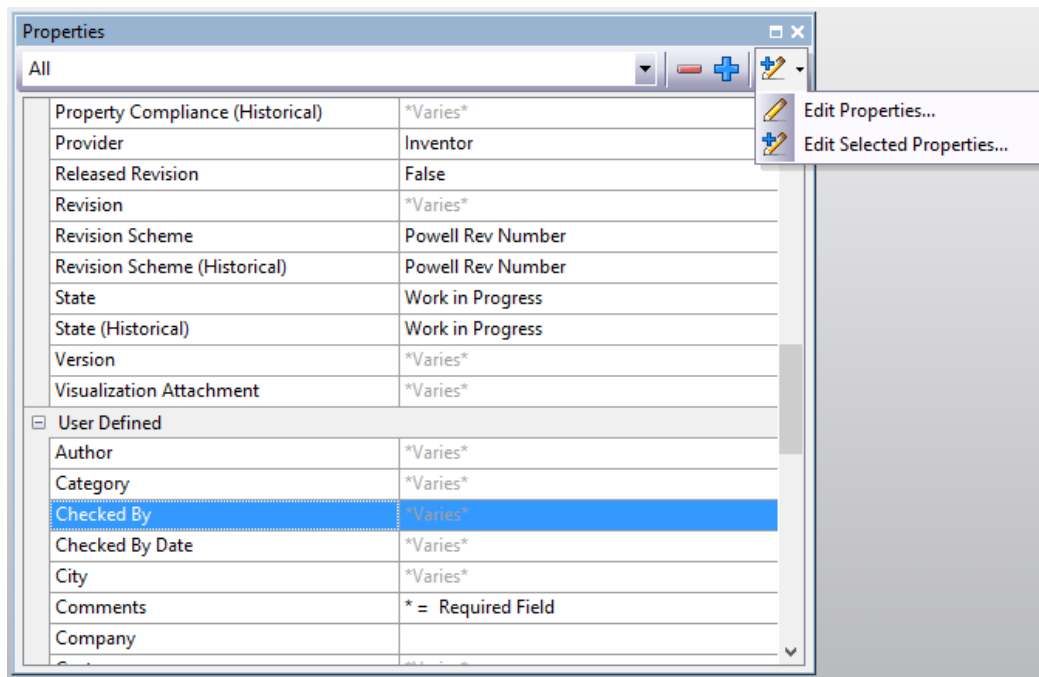
The new value must match the data type for that property or the entry will be marked as incorrect. When finished editing select OK to process the changes. When finished updating the Property Edit Results screen shows you the results for each property edited and which were successful.



A report of the edit can be saved locally or in the Vault by selecting the appropriate button on the results window.

Edit Properties with The Properties Grid

The Vault Properties Grid can be shown or hidden on your main view by selecting the View menu and then either checking or unchecking the View Properties Grid button. By default, the grid, when visible, will be docked on the right side of the main view. The grid can be moved to other locations depending on the user's needs, or made to float. If multiple screens are present it can even be moved to a second monitor to make it larger without crowding the main view.



The above image shows the Properties Grid with all selections shown. To edit properties, select a file or group of files as in the above section. Select the pencil icon in the Properties grid to open the general properties editor that we looked at in the previous section. To edit specific properties, select a group of files in the main view, then select a group of properties in the grid, and select the Pencil with the Plus Sign as shown above to edit the selected properties, on the selected files. This is a quick method for making multiple changes at one time.

When first used, the properties grid will display all available property definitions, system and user defined, and will depend on whether you are looking at Files, Folders, Items, Change Orders or Custom Objects. To remove properties from the grid, select one or more and use the minus button at the top. To restore properties that were previously hidden, select the plus sign at the top for a list of hidden properties.

When finished editing press ok, and as in the previous section the results will be displayed for you. As with the main view, reports can be saved locally or to the Vault.

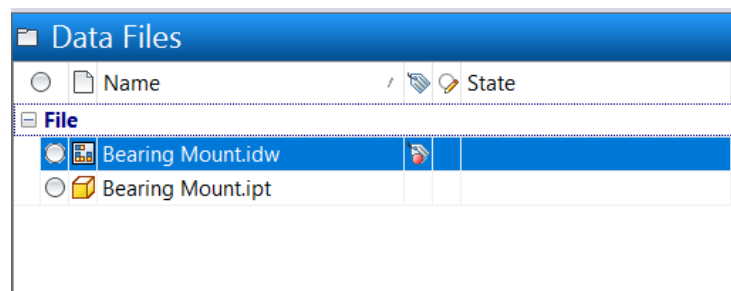
Add or Remove Properties

In the above section we talked about how to add or remove properties from the properties grid, or the properties editing window. But what if the Vault entity you are editing does not contain a specific property at all? Select an entity (file, folder, Item etc), and go to Actions\Add or Remove Property. this may only be done on one entity at a time. A list of available property definitions will come up and you can select the properties to add to the entity.

Synchronize Properties

Often you may see a situation where the value of a property on a local file does not match the value of the same property on that file in the Vault. This will result in a property non-compliance, and will show up in the properties grid as a red exclamation point next to the property value. If your main view contains the column for Property Compliance, this will show up as a tag with a red circle in it as shown below.

Property Compl...	Noncompliant equ...
Property Compl...	Compliant
Provider	Inventor
Released Revisi...	False
Revision	!
Revision Scheme	
Revision Schem...	
State	
State (Historical)	
Version	3



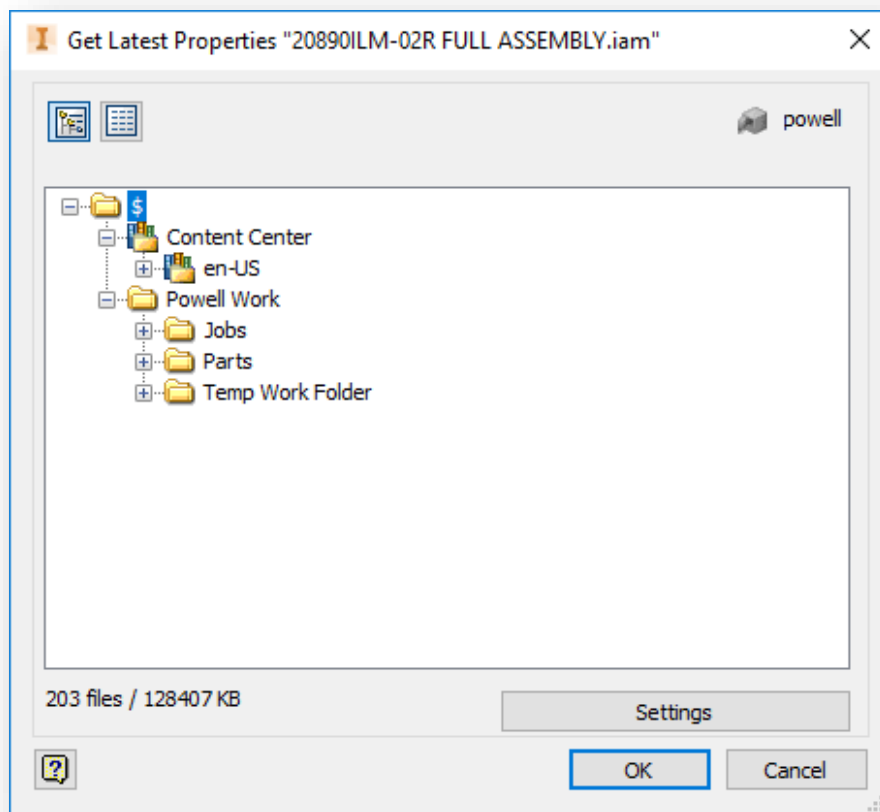
To fix this, select the file or files and use Synchronize properties from the Actions menu above. Depending on how your properties are mapped, the file property and Vault property will be brought to the same value, and the error icons cleared. This can also be set up as a job processor function if you are using that tool. We will not cover the job processor in this class, however.

Property Management with Add Ins

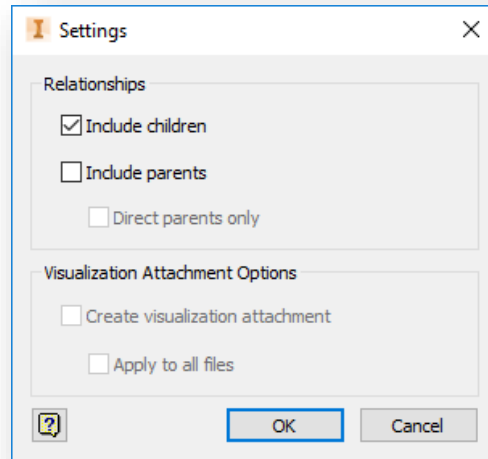
Update Properties

The Vault Add Ins for most supported Autodesk products will contain an Update Properties command. This command is used from the software side to synchronize property values between the local file and the Vault data. If you are using the Vault Revision table, this update properties feature is built in and will keep the revision table properties in sync with the Vault released data. In AutoCAD, the command line **vltgetlatestproperties** will call the Update Properties command also. You will be prompted for the Vault file name.

In Inventor, the Update Properties command gives you several options for viewing the files that are currently checked out and which can be updated.



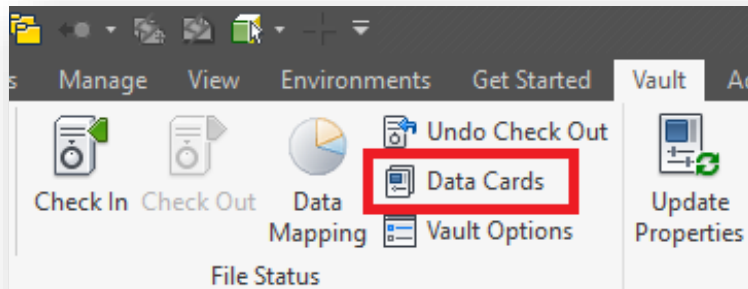
In the initial dialog, the two buttons at the top allow you to choose to view the files in a tree structure or a flat list. Under settings are options for including parents or children, and also for visualization settings in drawing files.



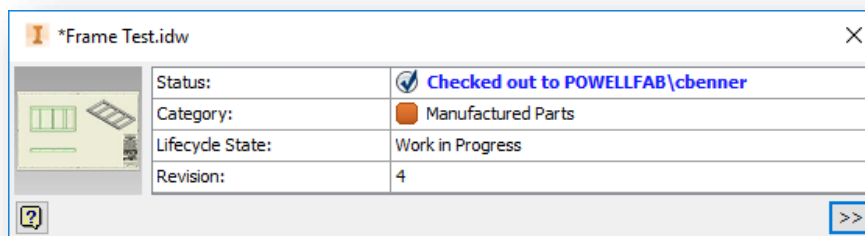
Inventor Data Cards

In an above section we talked about how to set up Data Cards for Inventor, to be able to view and edit multiple properties all in one place. This is above and beyond the iProperties editor, since it may contain some or all of those as well as properties that are mapped from Vault.

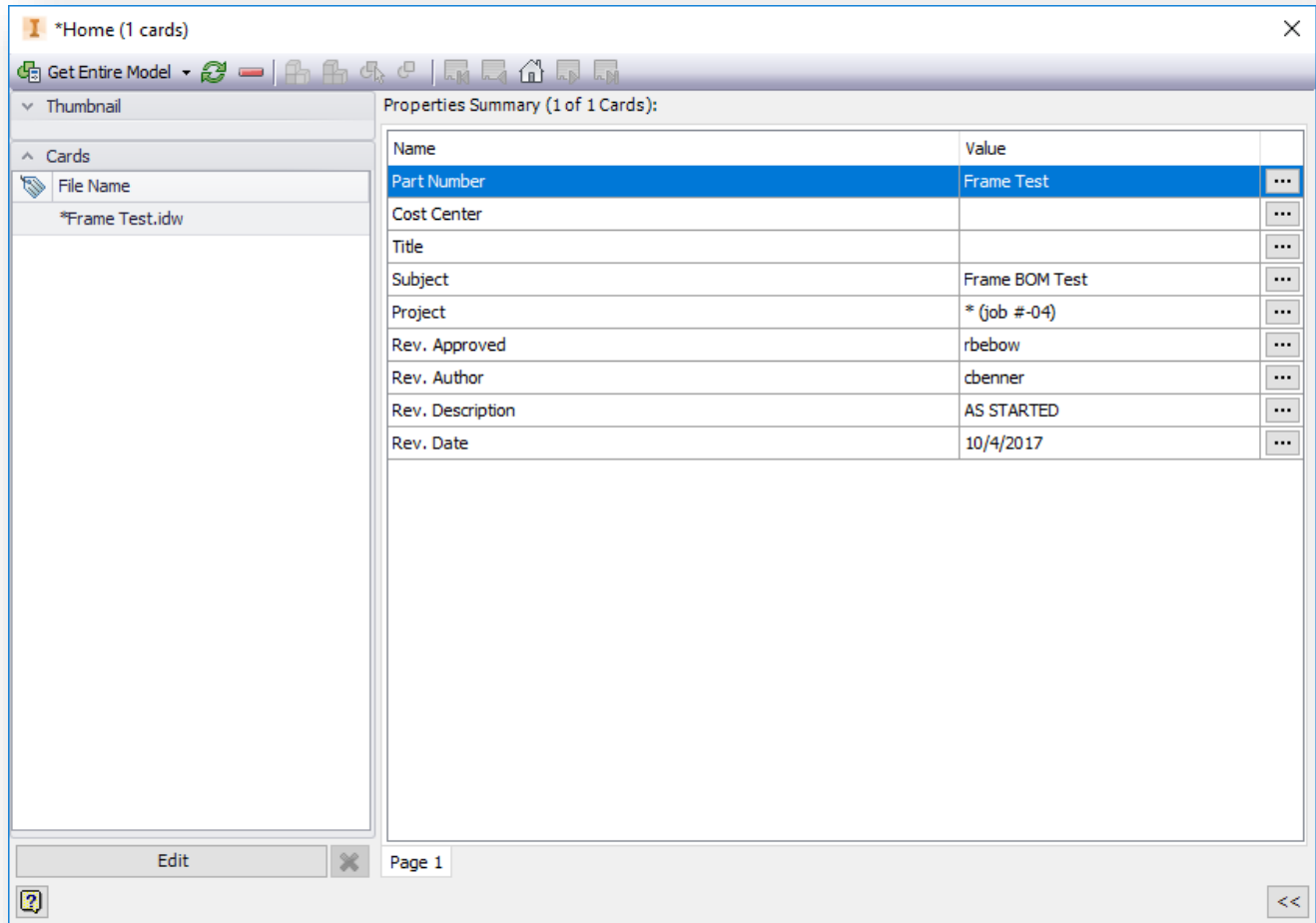
In this section we will look at how to access these Data Cards in Inventor, and how to use them. The command for Data Cards is located on the Vault tab of your ribbon, which is only available if the Vault Add In for Inventor is installed.



When first opened, the default view will show you a thumbnail image of the file and the values of Vault Status, Category, Lifecycle State and Revision.



Expand the data card by clicking the >> in the lower right corner. Once expanded, the card will show the properties that were set up inside of Vault, as described above in **Configuring Inventor Data Cards**.



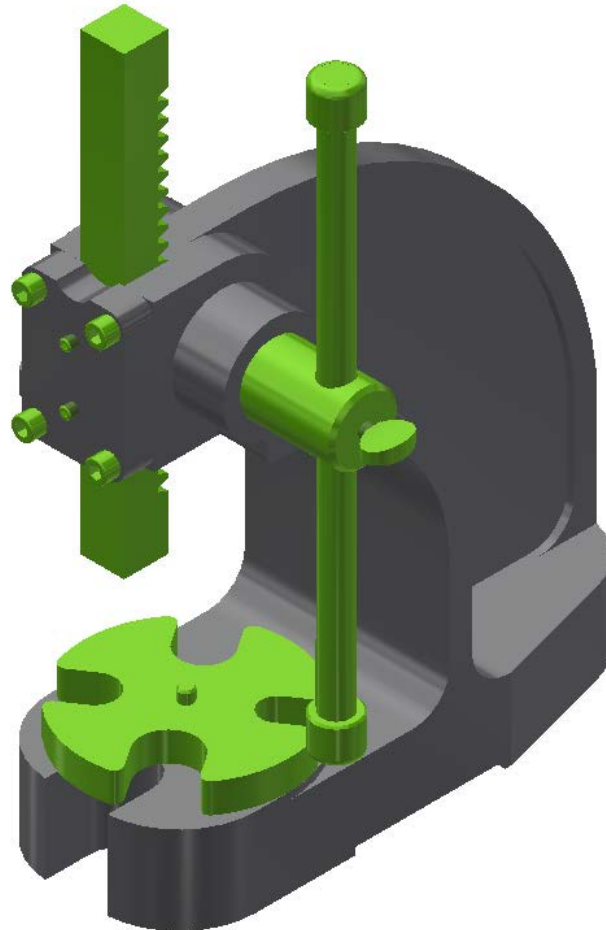
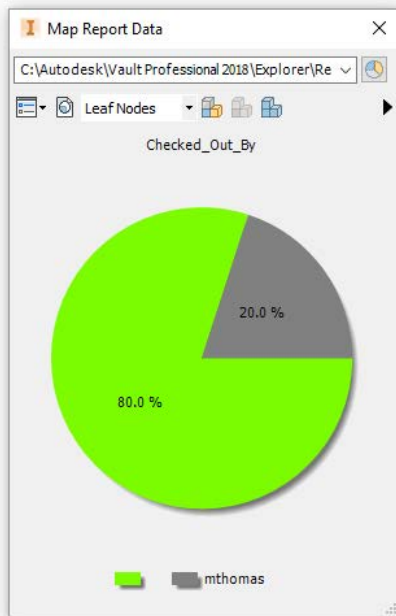
When expanded the data card should be a single card showing properties for the top level file, if more than one file is in session. The Edit button on the bottom will open the properties for editing, and will change to apply for when you are finished editing. If more than one page was set up in the Vault, you will see multiple page tabs.

To create a card deck, select the Get Entire Model button at the top. All files associated with the top level file (for example, all parts and assemblies that are in session associated with an open drawing file) will be added to the card deck. To remove individual cards, select them in the file list and press the **-** button on top. To scroll through the files on at a time there are forward and back buttons along the top, as well as a Home button to take you back to the top level.

If the data card deck is opened from an assembly file, there are buttons along the top to isolate an individual part from the list, and to turn off that isolation. You can also select and de-select an individual part from this list, to see where it is in your model. The data card will also warn you of any property compliance issues that need to be resolved.

Inventor Data Mapping

Within Inventor, use the Data Mapping feature to map report data onto the components contained within the model. The displayed chart corresponds with the coloring of the model. In the image shown below, the grey color represents the components currently checked out by mthomas and the green represents components currently not checked out.



Data Mapping is advantageous in that it provides a visual representation of your Vault property information, and how it impacts your models.

Use the dropdown along the top of the Map Report Data panel to select the desired report. With the report picked select the Generate Report icon (to the right of the dropdown) to generate the report and populate the chart. Use the toolbar to map the data on the model, choosing the desired level before applying the coloring.

The Autodesk Knowledge Network (AKN) contains information on creating your own reports. This is not covered in this class.

It's a Wrap

Mike and I sincerely hope we have helped you get a handle on your Vault properties, and shown you a few of the ways to create, edit and manage your data. Thank you!