

# OTx SERIES

Foundation of collaborative design:  
Vault PLM with powerFLC

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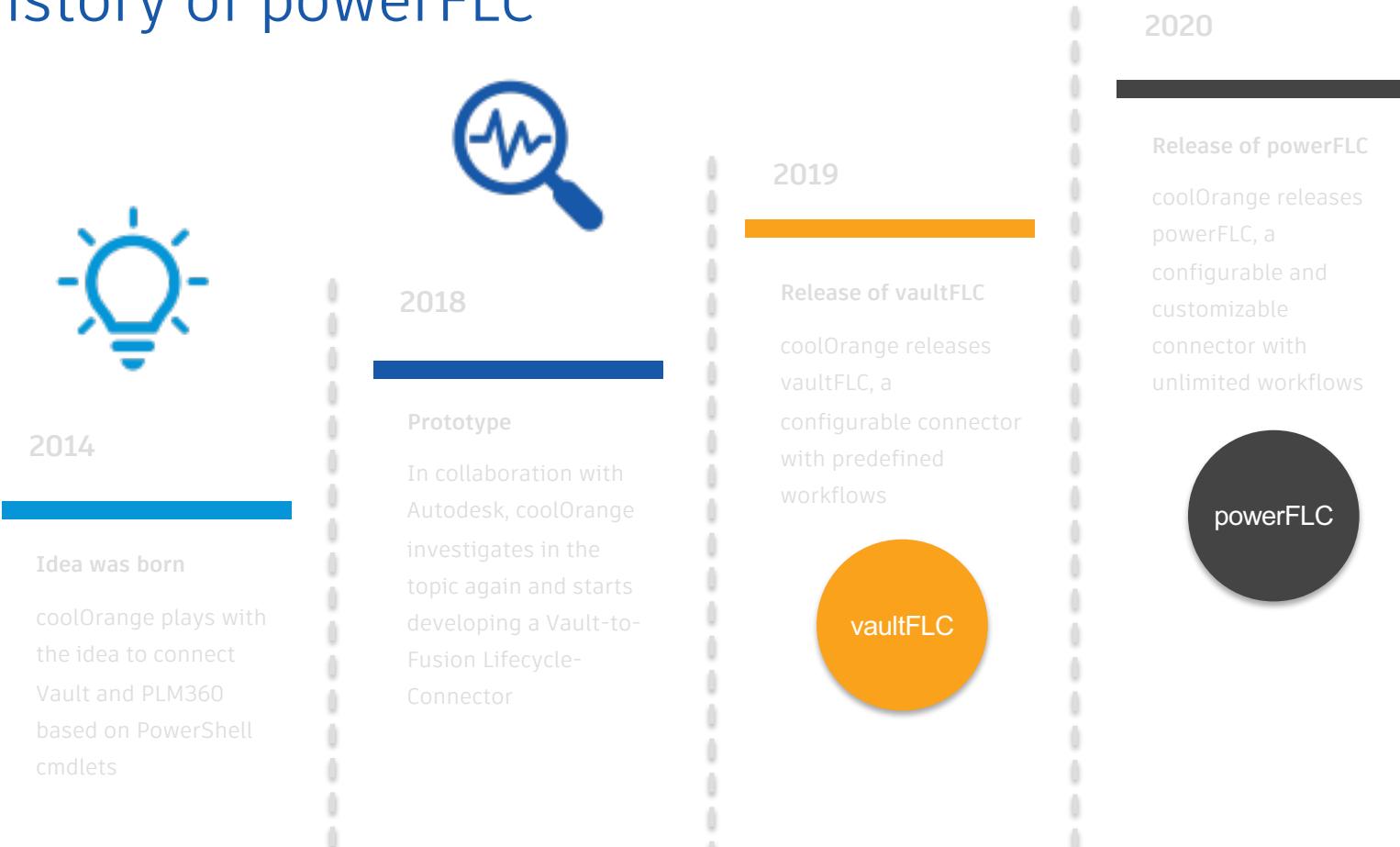


# Agenda

## Vault PLM with powerFLC

- vaultFLC vs. powerFLC
- Out-of-the-box Capabilities
- Components
- Installation and Configuration
- Additional Resources

# History of powerFLC



# vaultFLC vs. powerFLC

## vaultFLC

### Hardcoded workflows

BOM workflow only supports Inventor files

### Configurable but not customizable

### Four built-in workflows

File centric BOM publishing

Change Order synchronization (file based)

Folder synchronization (NPI)

File (drawing) publishing

### Limited to built-in workflows

### Standalone Product

## powerFLC



### Script-based workflows

Any objects in Vault supported



### Configurable and customizable



### One built-in workflow

Item centric BOM publishing

### Extendable with any workflow

Folder synchronization (NPI)

File centric BOM publishing

File (drawing) publishing

Change Order synchronization (ECO based)

Many others...



### Bundled with powerJobs Processor

powerJobs Processor license included



# powerFLC

## Out-of-the-box Capabilities

# powerFLC – what's in the box?

## powerFLC Processor

- A full powerJobs Processor (with all jobs and possibilities)
- Cmdlets (*/kə'ma:nd'let/*) for reading, searching, creating, updating and uploading FLC items, attachments and BOMs
- Based on Autodesk Forge and the FLC V3 API
- Configuration Manager to change workflow behaviors and define property/field mappings
- Vault Item and BOM publishing workflow (created in collaboration with Autodesk)

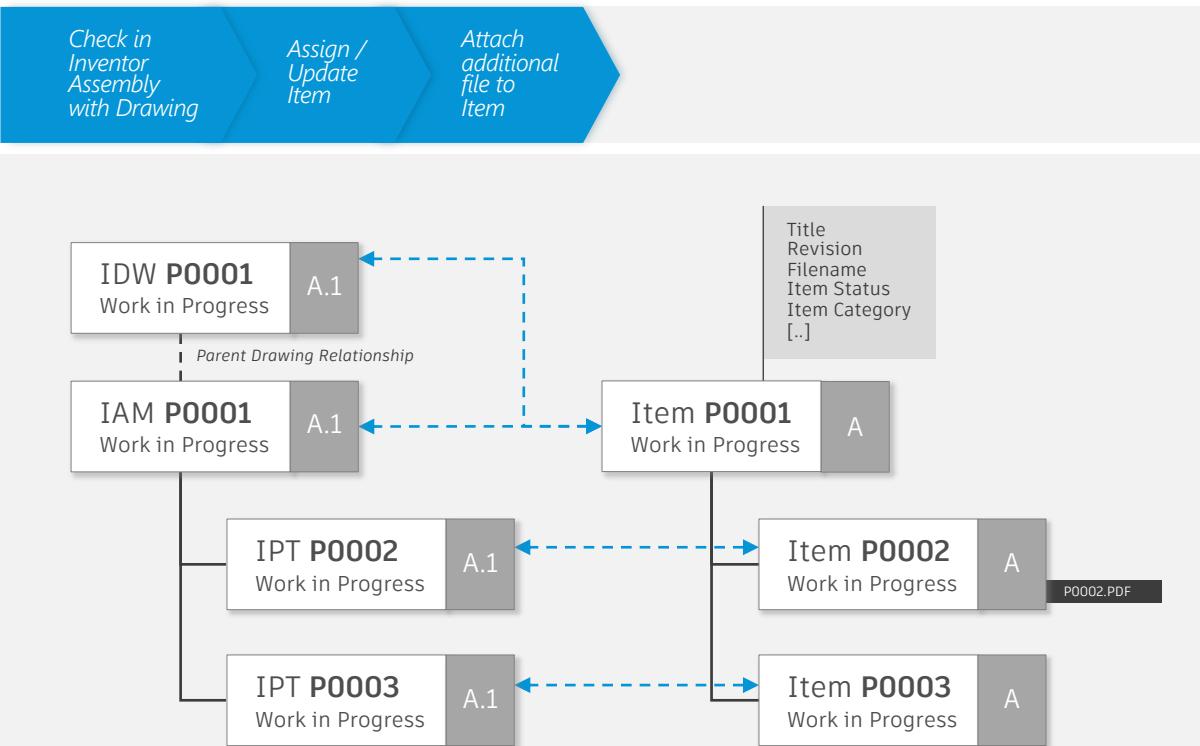
Additional Workflow templates / samples available



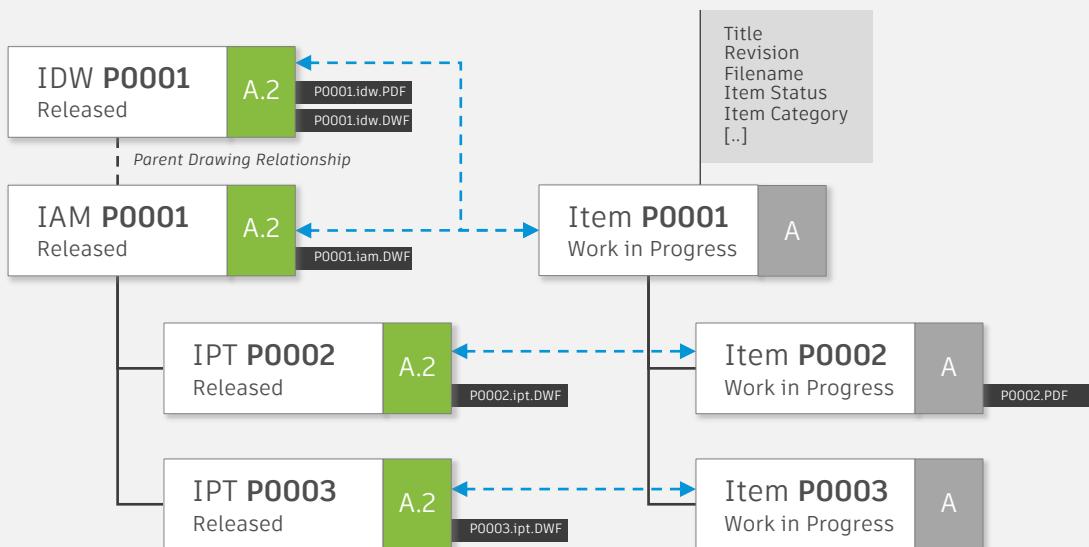
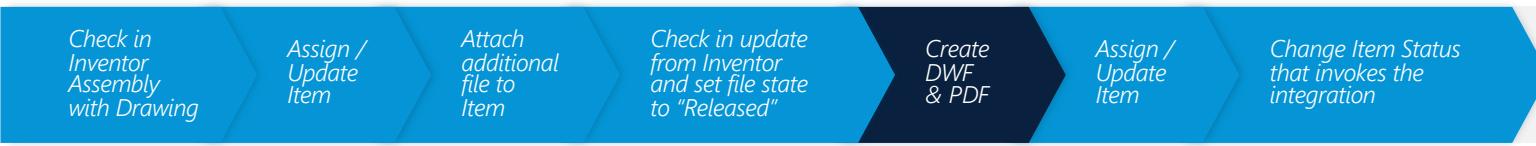
# Items and BOM workflow – Key Features

- **Vault Item centric**
  - Vault Item BOM is derived from CAD Data (Inventor, ACADM, ACADE, SWx) or built based on manually created items
  - Triggered on Vault item release (or any other lifecycle state transition)
- **Publish Vault Item metadata to FLC**
  - Item metadata
  - Primary linked file metadata
  - Vault thin- and thick client links
- **Publish engineering BOMs to FLC**
  - Merged BOM rows (Inventor “Part Number Row Merge Settings”)
  - Rows manually added in Fusion Lifecycle
  - Cutting list (Part List Details)
  - Raw materials
  - Virtual Components
- **Upload Vault Item attachments and associated files attachments**
- **Fusion Lifecycle App (workspace) available**

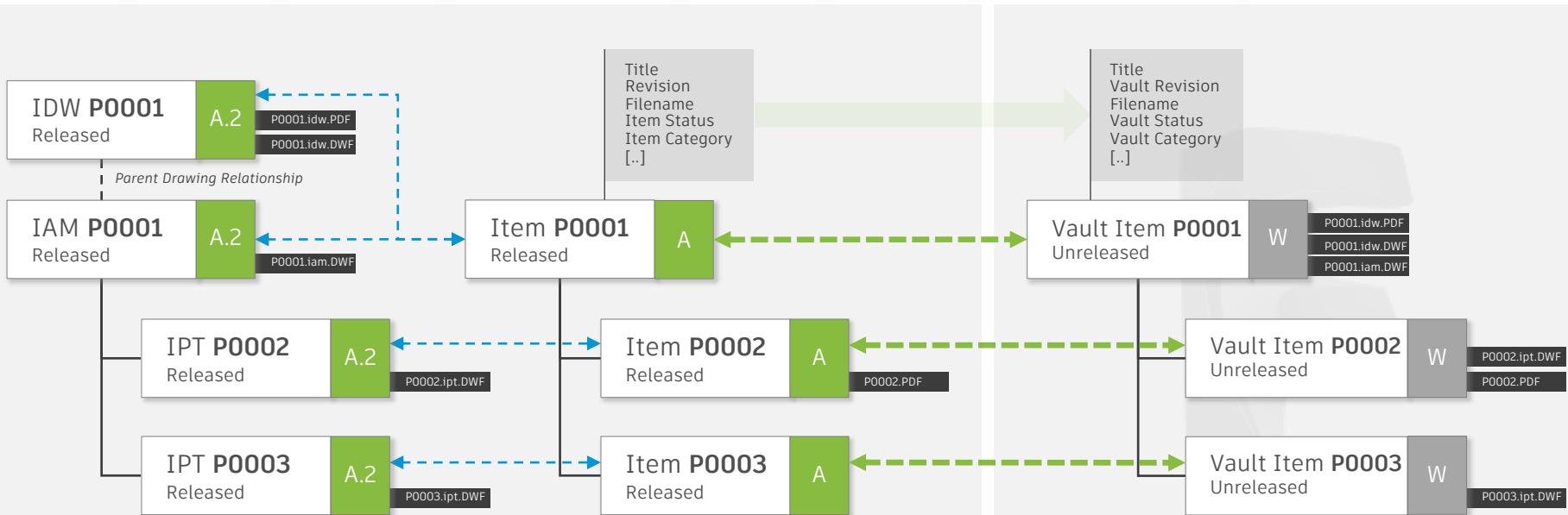
# Items and BOM workflow – Process



# Items and BOM workflow – Process

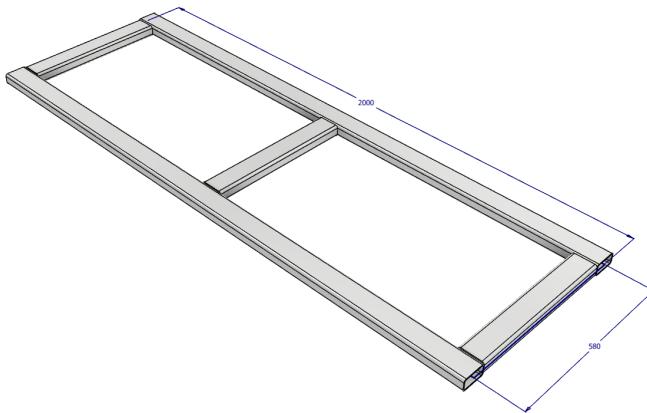


# Items and BOM workflow – Process



# Raw Material Handling

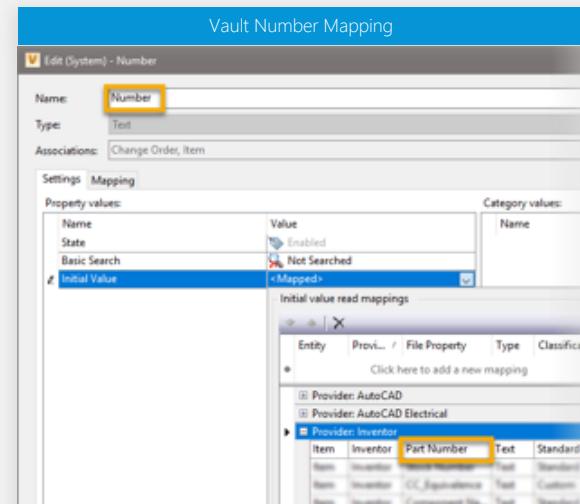
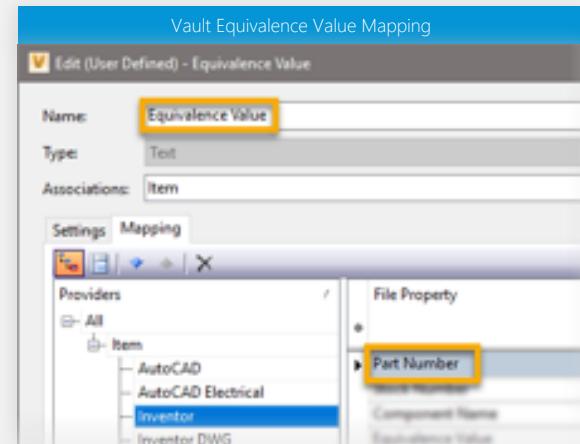
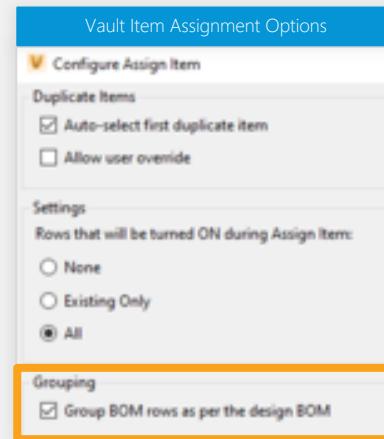
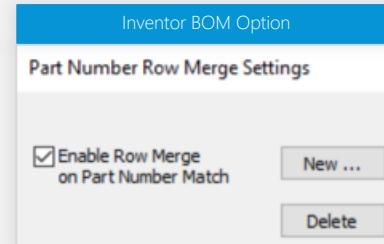
Handling of same raw material used in different sizes within the same assembly depends on Vault & Inventor options



## SCENARIO #1

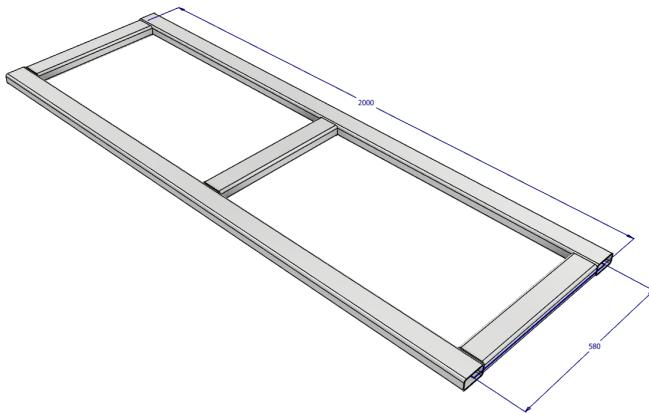
Inventor merges BOM rows based on Part Number match.

Vault uses the **Part Number** to identify items and to recognize equivalent items.



# Raw Material Handling

Handling of same raw material used in different sizes within the same assembly depends on Vault & Inventor options



## SCENARIO #1

Inventor merges BOM rows based on Part Number match.

Vault uses the **Part Number** to identify items and to recognize equivalent items.

Inventor BOM

Bill of Materials [01-1107.iaw]

Thumbnail	I.	Δ	Part Number	Item QTY	BOM Structure	Title	Material	Description	QTY	Unit QTY	Base Unit
▶	1		ISO 10799-2 - 80 x 40 x 4 - 2000	2	Normal	Profile Bar	Steel, ...	Structural steels - Cold-formed, welded, structural hollow sections	4000,000 mm	2000,000 mm	mm
▶	2		ISO 10799-2 - 80 x 40 x 4 - 500	3	Normal	Profile Bar	Steel, ...	Structural steels - Cold-formed, welded, structural hollow sections	1500,000 mm	500,000 mm	mm

Vault File Structure

File Name	Category Name	Title	Part Number	Description
01-1107.idw	Drawing Inventor	Vault-FLC Sample	01-1107	Item Assignment Sample File
01-1107.iaw	Assembly	Vault-FLC Sample	01-1107	
01-1108.ipt	Reference	Skeleton	01-1108	
01-1109.iaw	Phantom	Frame Assemblies		Base Frame
01-1115.ipt	Phantom	Frame Skeleton Part(s)		Framegenerator-Skeleton-Reference
01-1118.ipt	Frame Member	Profile Bar	ISO 10799-2 - 80 x 40 x 4 - 500	Structural steels - Cold-formed, welded, structural hollow sections
01-1119.ipt	Frame Member	Profile Bar	ISO 10799-2 - 80 x 40 x 4 - 500	Structural steels - Cold-formed, welded, structural hollow sections
01-1120.ipt	Frame Member	Profile Bar	ISO 10799-2 - 80 x 40 x 4 - 500	Structural steels - Cold-formed, welded, structural hollow sections
01-1121.ipt	Frame Member	Profile Bar	ISO 10799-2 - 80 x 40 x 4 - 20...	Structural steels - Cold-formed, welded, structural hollow sections
01-1122.ipt	Frame Member	Profile Bar	ISO 10799-2 - 80 x 40 x 4 - 20...	Structural steels - Cold-formed, welded, structural hollow sections

Vault BOM

01-1107 - Work in Progress - Item

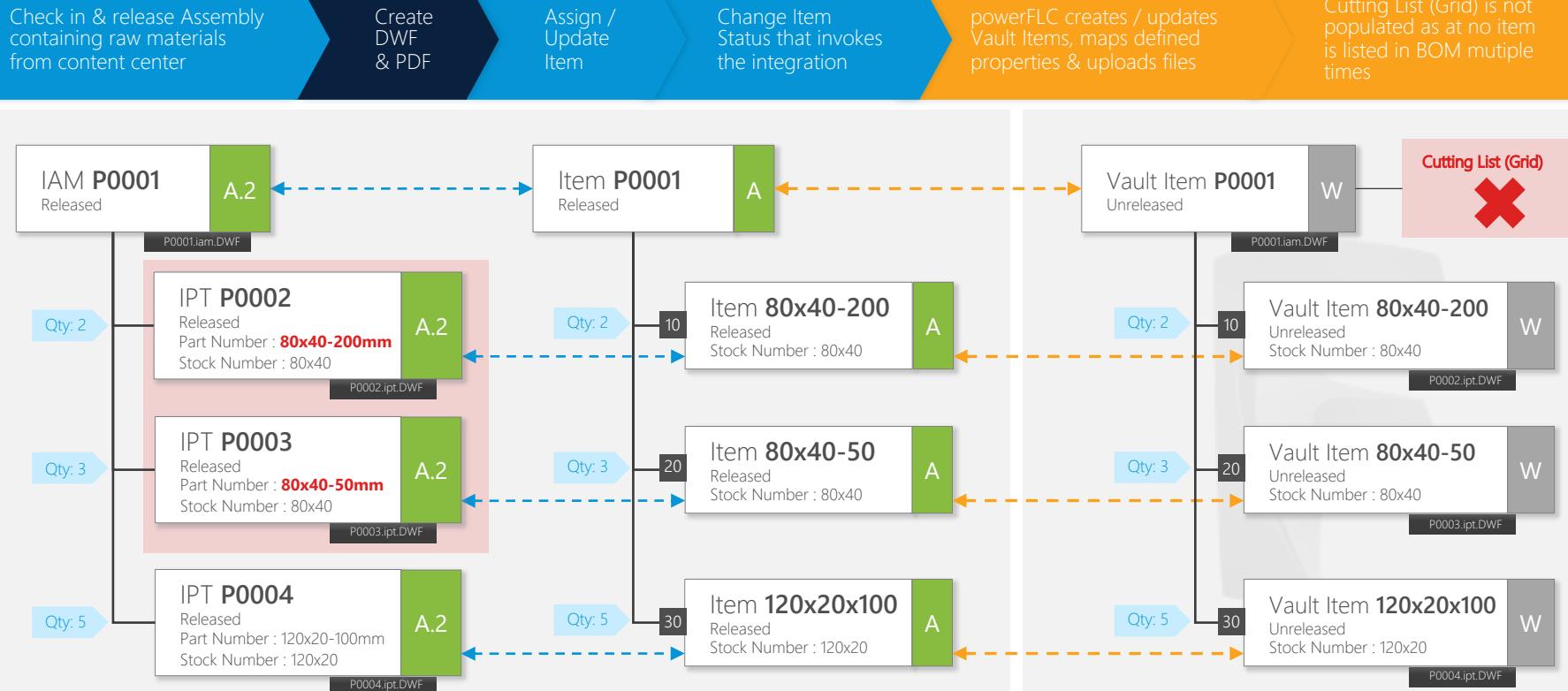
Number	Row Order	Position ...	Item Qty	Quantity	Title (Item,CO)	Description (Item,CO)	Material	Dimensions (BOM Pos.)	State
01-1107	-	-	-	-	Vault-FLC Sample			-	Work in Prog...
ISO 10799-2 - 80 x 40 x 4 - 2000	1	1	2	4000 Millimeter	Profile Bar	Structural steels - Cold-for...	Steel, Mild	40x80x2000 mm	Work in Prog...
ISO 10799-2 - 80 x 40 x 4 - 500	2	3	1500 Millimeter	Profile Bar	Structural steels - Cold-for...	Steel, Mild	40x80x500 mm	Work in Prog...	

# Raw Material Handling

Handling of same raw material used in different sizes within the same assembly depends on Vault & Inventor options

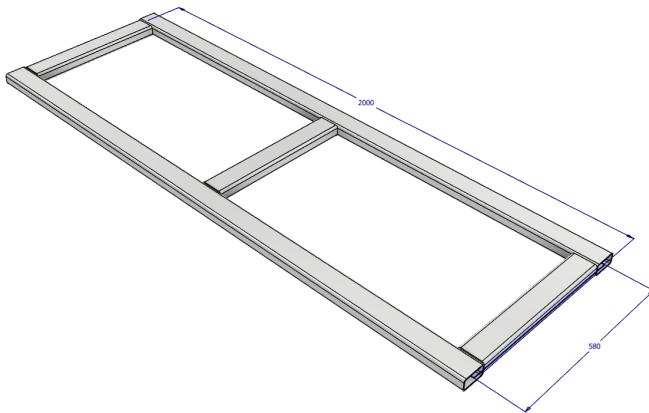
## SCENARIO #1

Inventor merges BOM rows based on Part Number match.  
Vault uses the Part Number to identify items and to recognize equivalent items.



# Raw Material Handling

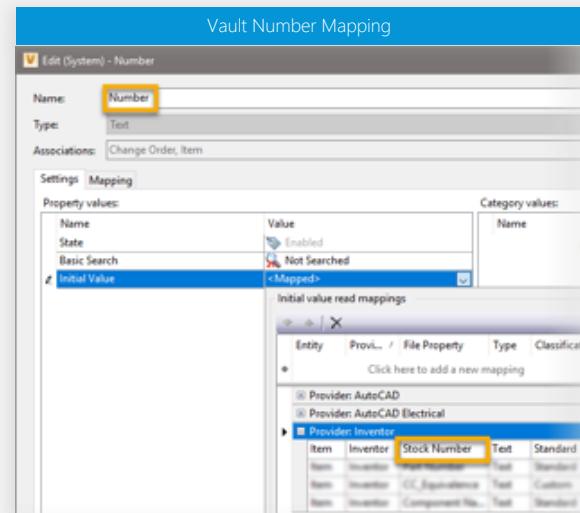
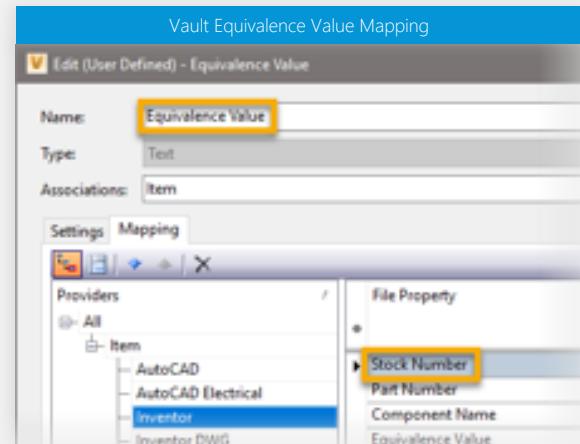
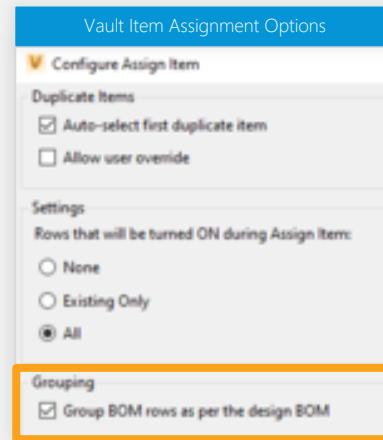
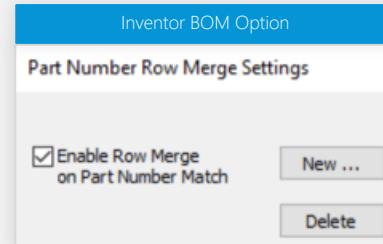
Handling of same raw material used in different sizes within the same assembly depends on Vault & Inventor options



## SCENARIO #2

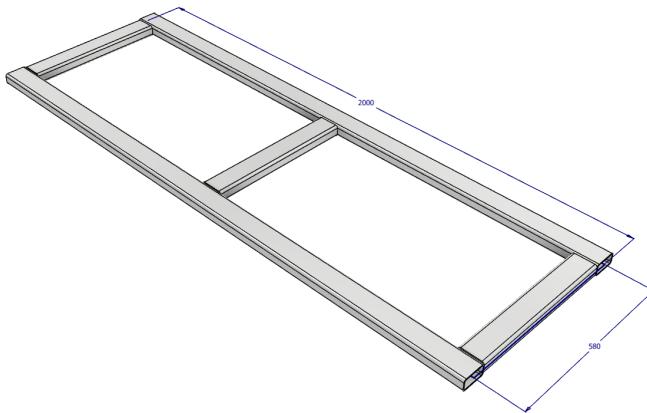
Inventor merges BOM rows based on Part Number match.

Vault uses the **Stock Number** to identify items and to recognize equivalent items.



# Raw Material Handling

Handling of same raw material used in different sizes within the same assembly depends on Vault & Inventor options



## SCENARIO #2

Inventor merges BOM rows based on Part Number match.

Vault uses the **Stock Number** to identify items and to recognize equivalent items.

Inventor BOM

Bill of Materials [01-1107.iam]

Thumbnail	Part Number	Item QTY	BOM Structure	Title	Material	Description	QTY	Unit QTY	Base Unit
ISO 10799-2 - 80 x 40 x 4 - 2000	1	2	Normal	Profile Bar	Steel, ...	Structural steels - Cold-formed, welded, structural hollow sections	4000,000 mm	2000 mm	mm
ISO 10799-2 - 80 x 40 x 4 - 500	2	3	Normal	Profile Bar	Steel, ...	Structural steels - Cold-formed, welded, structural hollow sections	1500,000 mm	500,000 mm	mm

Vault File Structure

File Name	Category Name	Title	Part Number	Description
01-1107.idw	Drawing Inventor	Vault-FLC Sample	01-1107	Item Assignment Sample File
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01-1109.jam	Phantom	Frame Assemblies		Base Frame
01-1115.ipt	Phantom	Frame Skeleton Part(s)		Framegenerator-Skeleton-Reference
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01-1119.ipt	Frame Member	Profile Bar	ISO 10799-2 - 80 x 40 x 4 - 500	Structural steels - Cold-formed, welded, structural hollow sections
01-1120.ipt	Frame Member	Profile Bar	ISO 10799-2 - 80 x 40 x 4 - 500	Structural steels - Cold-formed, welded, structural hollow sections
01-1121.ipt	Frame Member	Profile Bar	ISO 10799-2 - 80 x 40 x 4 - 20...	Structural steels - Cold-formed, welded, structural hollow sections
01-1122.ipt	Frame Member	Profile Bar	ISO 10799-2 - 80 x 40 x 4 - 20...	Structural steels - Cold-formed, welded, structural hollow sections

Vault BOM

01-1107 - Work in Progress - Item

Number	Row Order	Position ...	Item Qty	Quantity	Title (Item,CO)	Description (Item,CO)	Material	Dimensions (BOM Pos.)	State
01-1107	1	-	1	2	4000 Millimeter	Profile Bar	Structural steels - Cold-form...	40x80x2000 mm	Work in Progress
	2	-	2	3	1500 Millimeter	Profile Bar	Structural steels - Cold-form...	40x80x500 mm	Work in Progress

# Raw Material Handling

Handling of same raw material used in different sizes within the same assembly depends on Vault & Inventor options

## SCENARIO #2

Inventor merges BOM rows based on Part Number match.  
Vault uses the Stock Number to identify items and to recognize equivalent items.

Check in & release Assembly containing raw materials from content center

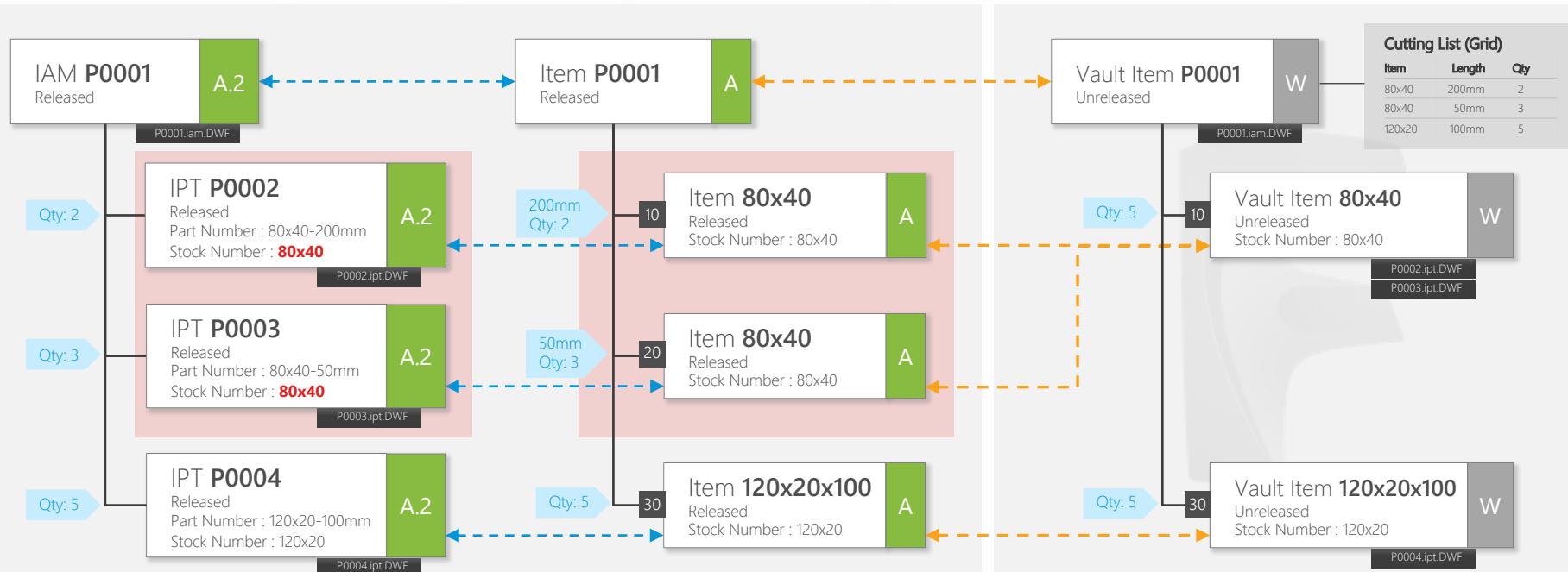
Create DWF & PDF

Assign / Update Item

Change Item Status that invokes the integration

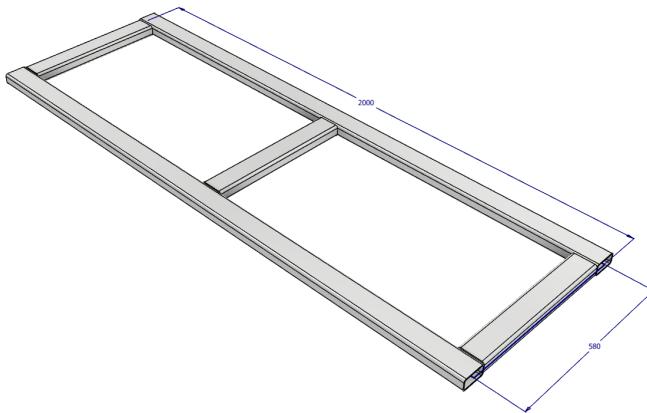
powerFLC creates / updates Vault Items, maps defined properties & uploads files

Cutting List (Grid) is populated as at least one item is listed in BOM multiple times



# Raw Material Handling

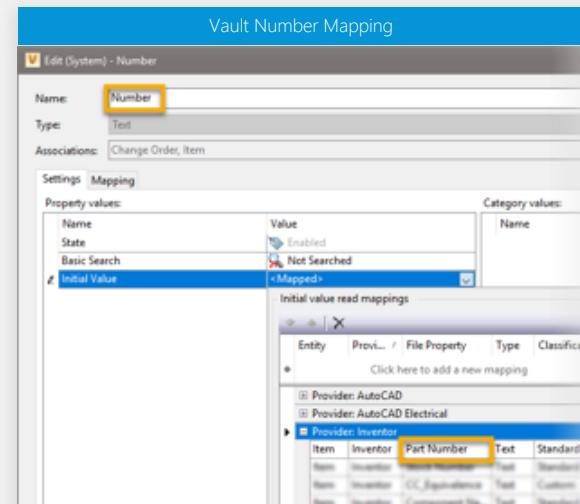
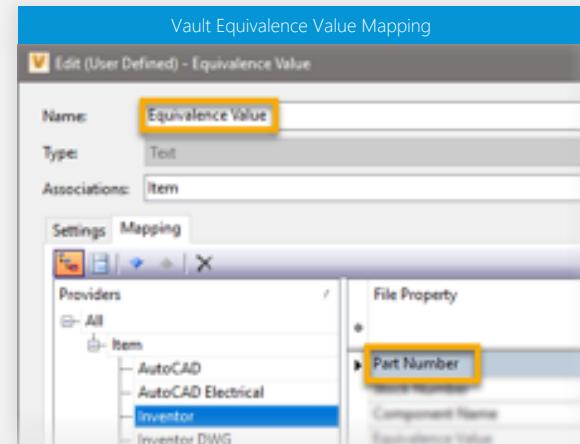
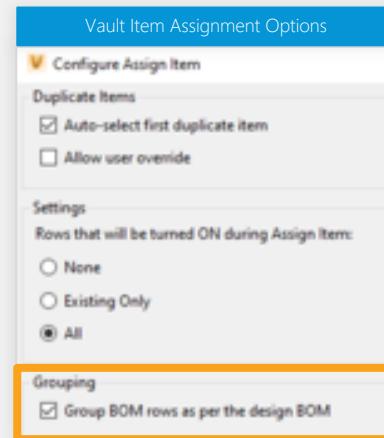
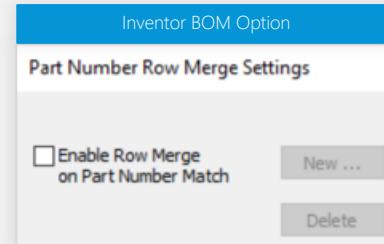
Handling of same raw material used in different sizes within the same assembly depends on Vault & Inventor options



## SCENARIO #3

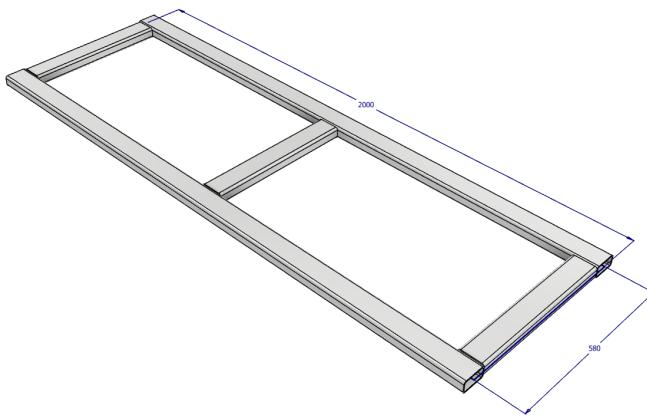
Inventor **does not** merge BOM rows.

Vault uses the **Part Number** to identify items and to recognize equivalent items.



# Raw Material Handling

Handling of same raw material used in different sizes within the same assembly depends on Vault & Inventor options



## SCENARIO #3

Inventor **does not** merge BOM rows.

Vault uses the **Part Number** to identify items and to recognize equivalent items.

Inventor BOM

The screenshot shows the Inventor BOM dialog with six rows of data. Each row represents a profile bar with the following details:

Thumbnail	Part Number	Item QTY	BOM Structure	Title	Material	Description	QTY	Unit QTY
ISO 10799-2 - 80 x 40 x 4 - 2000	1	1	Normal	Profile Bar	Steel, Mild	Structural steels - Cold-formed, welded, structural hollow sections	2000.000 mm	2000.000 mm
ISO 10799-2 - 80 x 40 x 4 - 2000	3	1	Normal	Profile Bar	Steel, Mild	Structural steels - Cold-formed, welded, structural hollow sections	2000.000 mm	2000.000 mm
ISO 10799-2 - 80 x 40 x 4 - 500	4	1	Normal	Profile Bar	Steel, Mild	Structural steels - Cold-formed, welded, structural hollow sections	500.000 mm	500.000 mm
ISO 10799-2 - 80 x 40 x 4 - 500	5	1	Normal	Profile Bar	Steel, Mild	Structural steels - Cold-formed, welded, structural hollow sections	500.000 mm	500.000 mm
ISO 10799-2 - 80 x 40 x 4 - 500	6	1	Normal	Profile Bar	Steel, Mild	Structural steels - Cold-formed, welded, structural hollow sections	500.000 mm	500.000 mm

Vault File Structure

The screenshot shows the Vault File Structure browser with a tree view of files and their properties. The structure includes:

- 01-1123.idw (Category Name: Drawing Inventor, Title: Vault-FLC Sample, Part Number: 01-1123, Description: Item Assignment Sample File)
- 01-1123.iam (Category Name: Assembly, Title: Vault-FLC Sample, Part Number: 01-1123, Description: Base Frame)
- 01-1124.ipt (Category Name: Reference, Title: Skeleton, Part Number: 01-1124, Description: Frame Assemblies)
- 01-1125.iam (Category Name: Phantom, Title: Frame Assemblies, Part Number: 01-1125, Description: Frame Skeleton Part(s))
- 01-1126.ipt (Category Name: Phantom, Title: Frame Member, Part Number: 01-1126, Description: Framegenerator-Skeleton-Reference)
- 01-1127.ipt (Category Name: Phantom, Title: Profile Bar, Part Number: ISO 10799-2 - 80 x 40 x 4 - 500, Description: Structural steels - Cold-formed, welded, structural hollow sections)
- 01-1128.ipt (Category Name: Phantom, Title: Profile Bar, Part Number: ISO 10799-2 - 80 x 40 x 4 - 500, Description: Structural steels - Cold-formed, welded, structural hollow sections)
- 01-1129.ipt (Category Name: Phantom, Title: Profile Bar, Part Number: ISO 10799-2 - 80 x 40 x 4 - 200, Description: Structural steels - Cold-formed, welded, structural hollow sections)
- 01-1130.ipt (Category Name: Phantom, Title: Profile Bar, Part Number: ISO 10799-2 - 80 x 40 x 4 - 500, Description: Structural steels - Cold-formed, welded, structural hollow sections)
- 01-1131.ipt (Category Name: Phantom, Title: Profile Bar, Part Number: ISO 10799-2 - 80 x 40 x 4 - 200, Description: Structural steels - Cold-formed, welded, structural hollow sections)

Vault BOM

The screenshot shows the Vault BOM dialog with multiple rows of data. The rows represent different sizes of profile bars with the following details:

Number	Order	Position...	Item...	Quantity	Title (Item,CO)	Description (Item,CO)	Material	Dimensions (BOM Pos.)	State
01-1123	-	-	-	1	2000 Millimeter	Profile Bar	Structural steels - Cold-f...	40x80x2000 mm	Work in Progress
ISO 10799-2 - 80 x 40 x 4 - 2000	1	1	1	2000 Millimeter	Profile Bar	Structural steels - Cold-f...	Steel, Mild	40x80x2000 mm	Work in Progress
ISO 10799-2 - 80 x 40 x 4 - 2000	2	3	1	2000 Millimeter	Profile Bar	Structural steels - Cold-f...	Steel, Mild	40x80x2000 mm	Work in Progress
ISO 10799-2 - 80 x 40 x 4 - 500	3	4	1	500 Millimeter	Profile Bar	Structural steels - Cold-f...	Steel, Mild	40x80x500 mm	Work in Progress
ISO 10799-2 - 80 x 40 x 4 - 500	4	5	1	500 Millimeter	Profile Bar	Structural steels - Cold-f...	Steel, Mild	40x80x500 mm	Work in Progress
ISO 10799-2 - 80 x 40 x 4 - 500	5	6	1	500 Millimeter	Profile Bar	Structural steels - Cold-f...	Steel, Mild	40x80x500 mm	Work in Progress

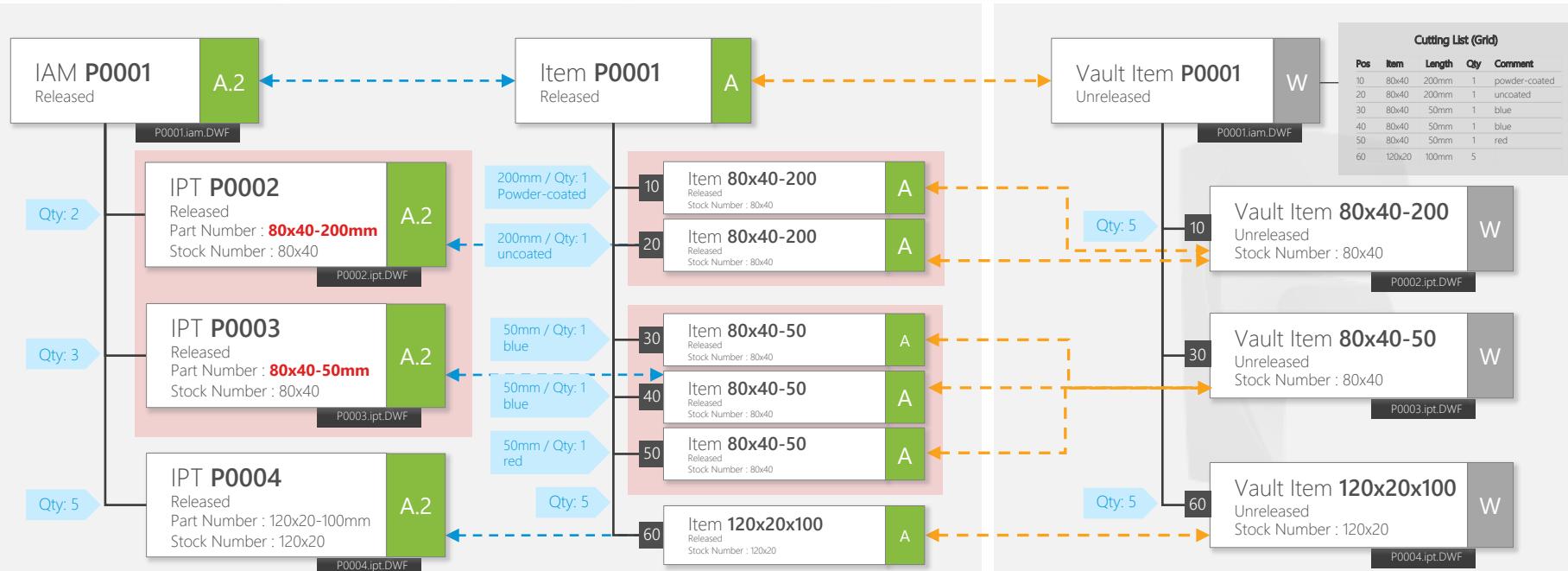
# Raw Material Handling

Handling of same raw material used in different sizes within the same assembly depends on Vault & Inventor options

## SCENARIO #3

Inventor does not merge BOM rows.

Vault uses the Part Number to identify items and to recognize equivalent items.



Autodesk Vault Professional 2021

File Edit View Go Tools Actions Help

New powerJobs Report... Plot... Go to: Enter an item number Find... Share View Download from Cloud Drive

All Items Workspace Sync... Change Category... Change State... Change Revision...

Search Help

Home

Item Master

Project Explorer (\$)

- Content Center Files
- Designs
  - AutoCAD Mechanical
  - CAD Admins ONLY
  - coolOrange
  - DXF
  - Factory Asset Library
  - Factory Asset Library Source
  - FDU Tutorial
  - Fusion Lifecycle
  - Imported Data
  - Inventor Sample Data
    - Car Seat
      - Fishing Rod Model
      - Inventor CAM
      - Inventor TolAnalysis
    - Jet Engine Model
    - Models
      - 3D Annotation
      - AEC Exchange
      - Assemblies
        - Blower
        - Engine MKII
        - Metal Container
        - Personal Computer
        - Scissors

My Worklist

ECO-000002 (7/31/2018)

My Shortcuts

- Documentation
  - M178-1000.iaw
  - M178-1000

Add new group

Home

Duplicates Dashboard

Project Explorer

4 Items (1 selected)

Item Master (Search Results)

Number	Revision	State	Title (Item,CO)
M178-1001	B	In Review	TABLE TOP, WORKSTATION
M178-1000	B	In Review	TABLE, MAIN
M178-1003	B	In Review	M178-1005
M178-1100	B	In Review	TABLE, TOP FRAM SUB ASSY

Properties

General History Bill of Materials Where Used Change Order View

Revision: Latest In Review

Number: M178-1000

Title: TABLE, MAIN

Description: TABLE, MAIN

Units: Each

Category: Assembly

Lifecycle State: In Review

Last Updated By: Administrator

Last Updated: 10/18/2020 2:52 PM

Associated files:

File Name	Version
M178-1000.idw	4
M178-1000.iaw	6
M178-1000.dwg	3
Assembly Instructions.pdf	1

Properties:

Name	/ Value
Equivalence Value	M178-1000



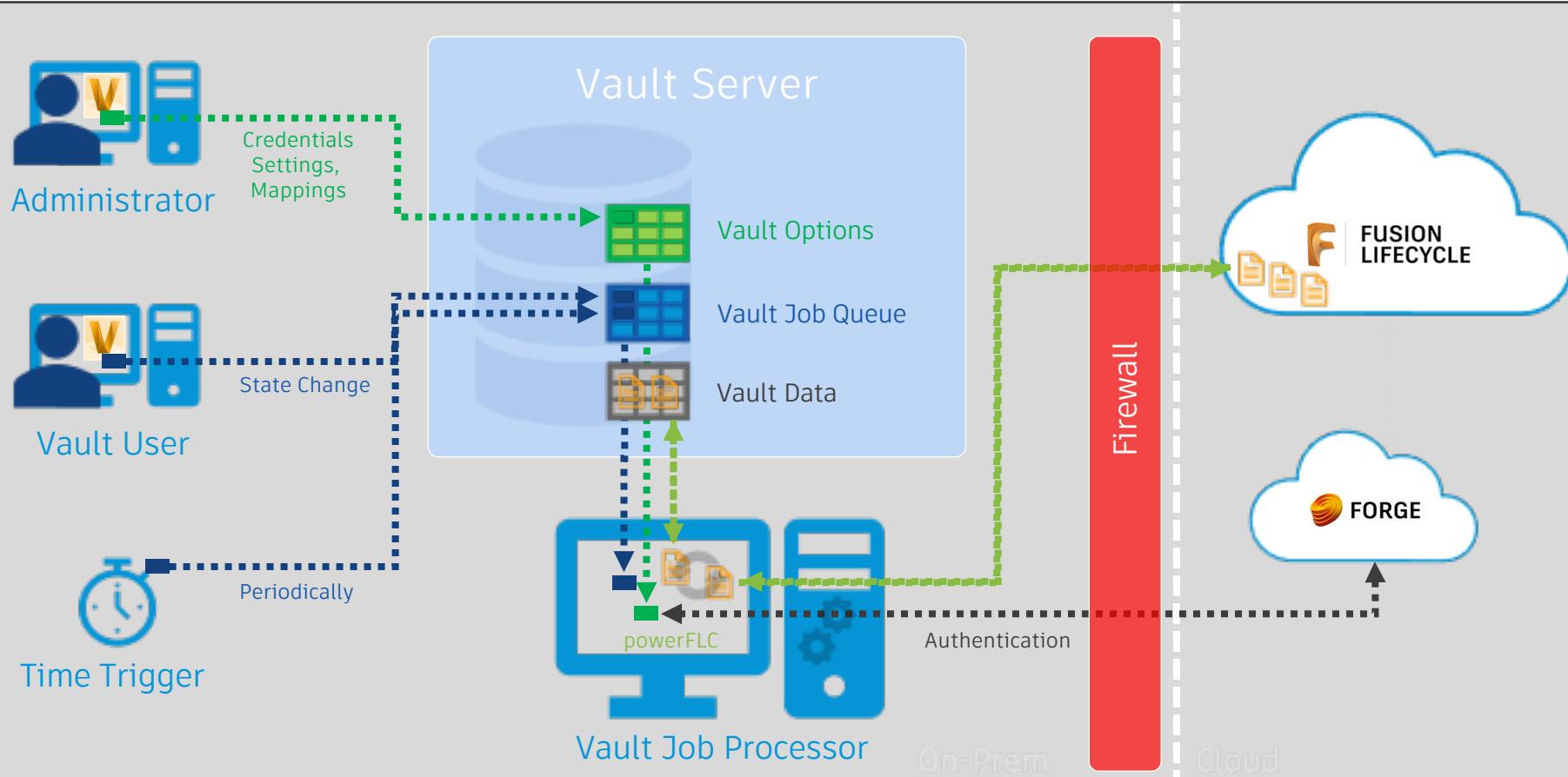
Type here to search



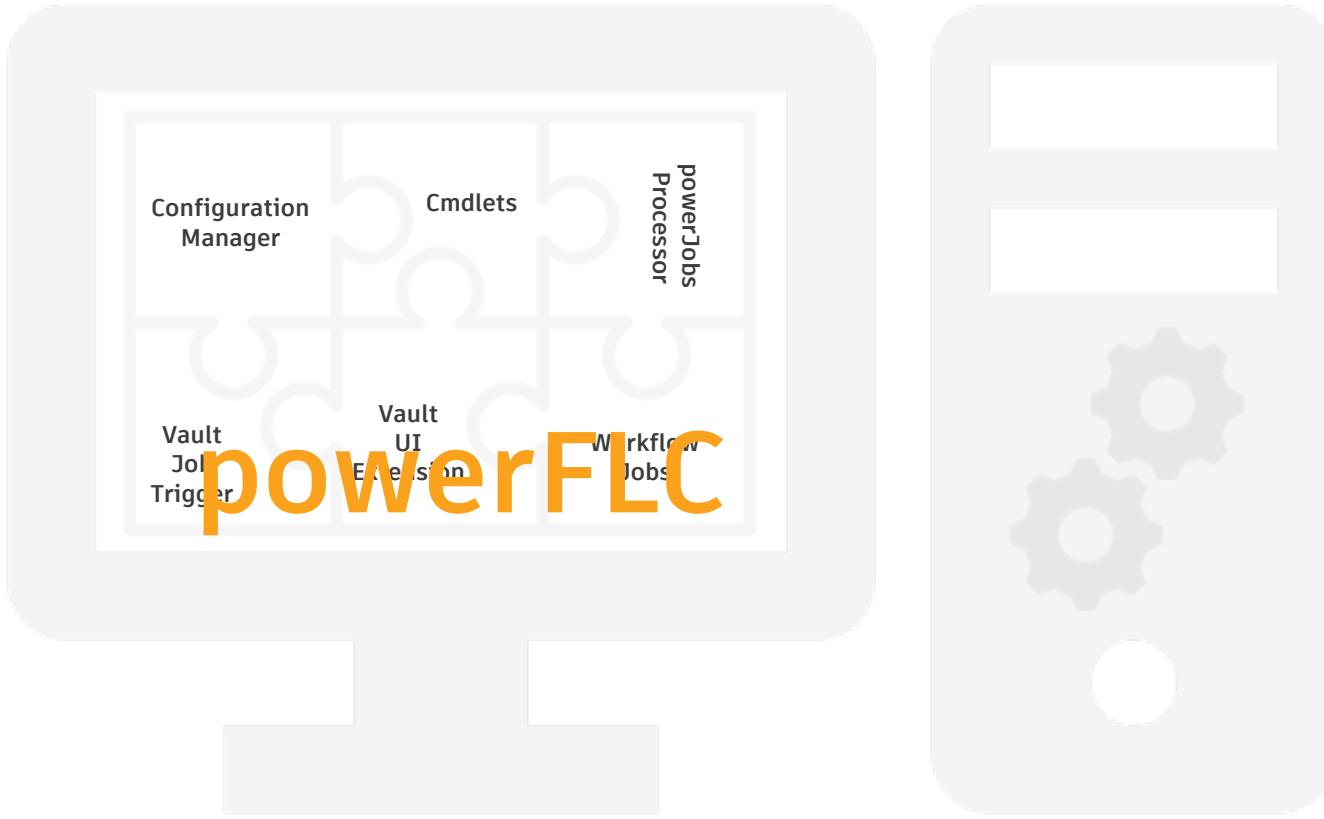
# powerFLC

## Architecture & Components

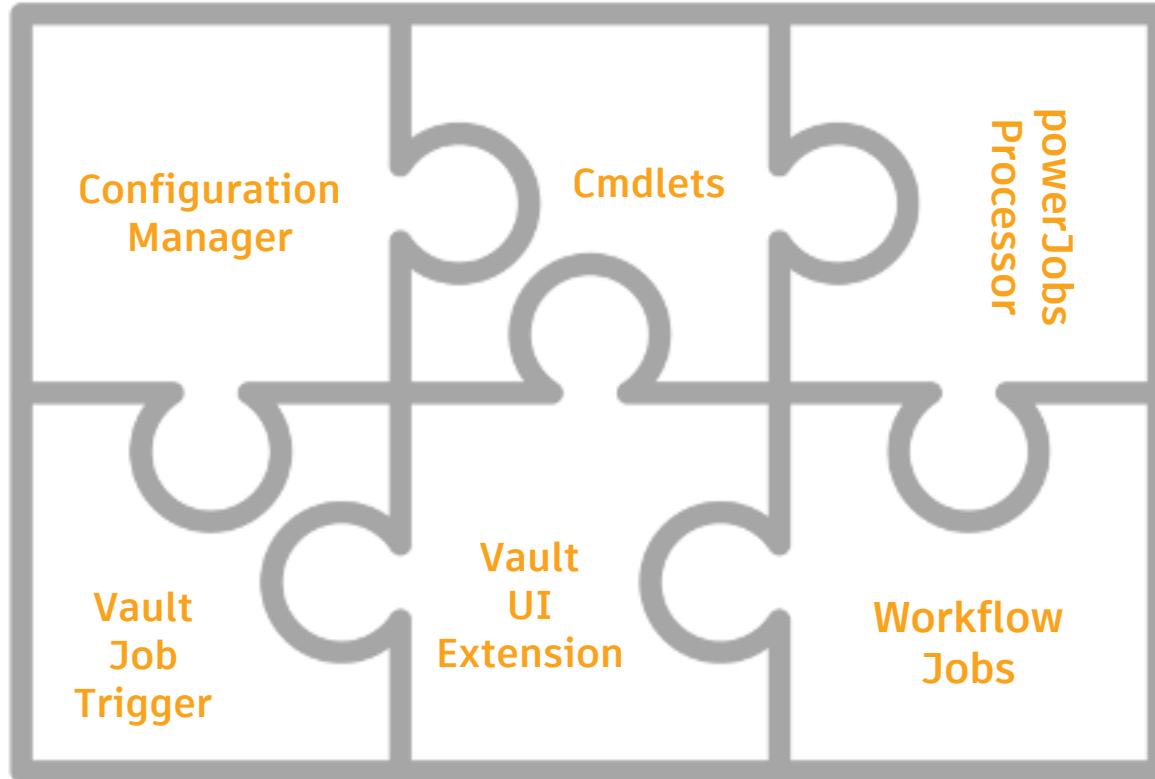
# powerFLC – Workflow Architecture



# powerFLC – Components

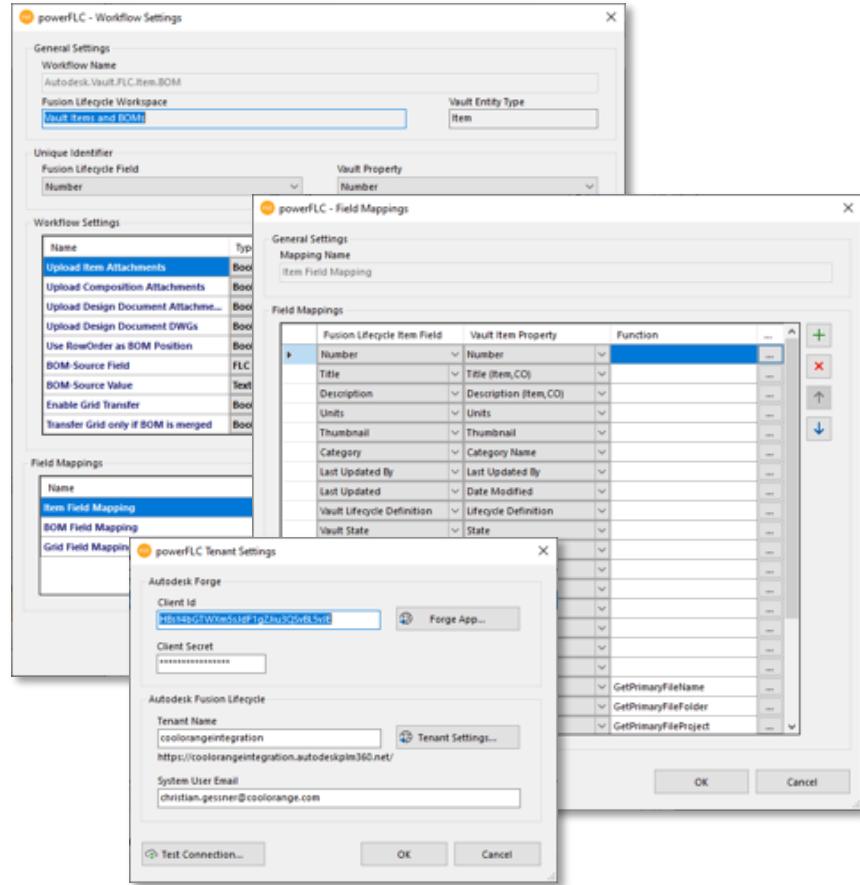


# powerFLC – Components



# powerFLC – Configuration Manager

- Graphical UI in Vault (Tools Menu)
- Tenant Configuration (Forge 2-legged Auth)
- Workflow Settings
  - Various settings for each workflow
- Field Mappings
  - Multiple mappings supported
  - Fusion Lifecycle field to Vault property mapping
  - Fusion Lifecycle field to Function mapping
- Import / Export workflow settings/mappings (JSON)
- Same UI for all workflows
- Configuration stored in Vault Options
- Configuration used by workflows (scripts)



# powerFLC + powerJobs Cmdlets

- Cmdlets hide the complexity of APIs
- Cmdlets are API version independent
  - Eliminates migration efforts
- 3rd party Cmdlets available
  - File operations
  - SQL connections
  - and many more...
- No advanced programming skills needed
  - PowerShell syntax is well documented
  - Administrators are used to PowerShell
  - Thousands of books, courses and examples available
- APIs can be accessed directly if needed



## powerFLC

Add-FLCAttachment
Add-FLCItem
Connect-FLC
Get-FLCBOM
Get-FLCItems
Update-FLCBOM
Update-FLCItem



## powerJobs

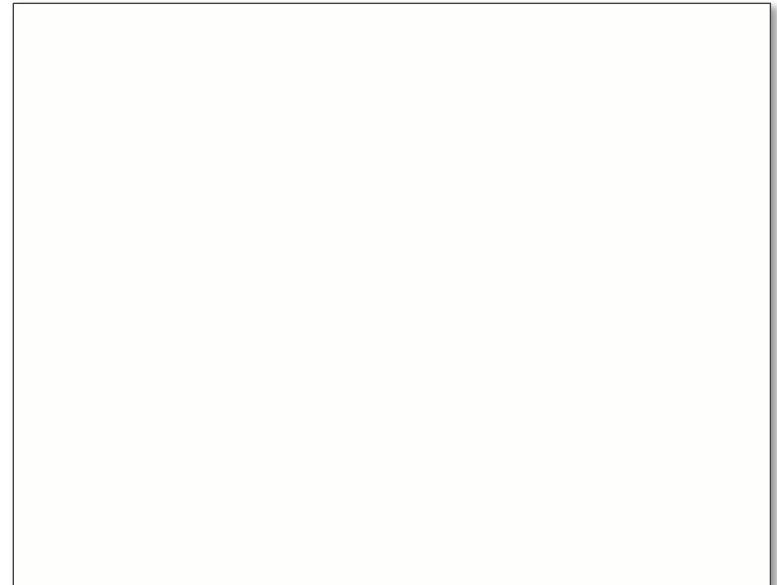
Close-Document
Export-Document
Open-Document
Open-VaultConnection
Add-VaultFile
Add-VaultJob
Get-VaultFile
Get-VaultFileAssociations
Get-VaultFileBom
Get-VaultFiles
Get-VaultItem
Get-VaultItemAssociations
Get-VaultItemBom
Save-VaultFile
Show-Inspector
Update-VaultFile
Update-VaultItem

# powerJobs Processor

- Vault Job Processor Extension
- Enables Job Processor to execute scripts
  - Scripts are cross compatible over different Vault versions
- Customizable scripts for
  - Automated Publishing
  - Automated Printing and Plotting
  - Email notifications
  - Files upload to Network drives, SharePoint, OneDrive...
- PowerShell Commands to
  - Create neutral formats (e.g. PDF, DXF, STEP, STL...)
  - Communicate with Vault
  - Communicate with Inventor
  - Communicate with AutoCAD / DWGTrueView
- “Time Triggered Jobs” functionality
  - Submits Jobs in a configurable interval



**powerJobs**



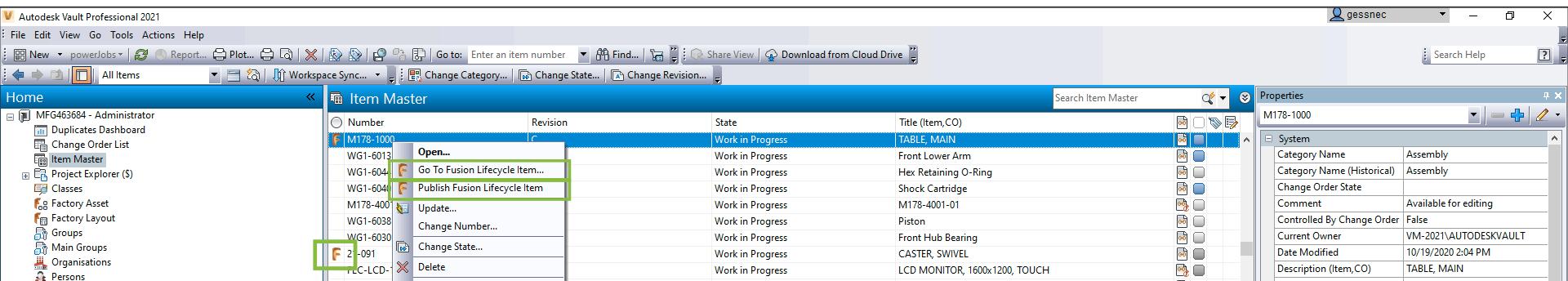
# Vault Job Trigger

- Vault's built-in "Custom Job Types" functionality
  - Triggers jobs on entity lifecycle state change
- coolOrange powerJobs Processor "Time Triggered Jobs" functionality
  - Triggers jobs in configurable intervals
- coolOrange powerEvents
  - Triggers jobs on any Vault actions
    - Check-in, Check-out, Change State, Delete...
    - Customizable (Scripting)
    - Not included in powerFLC – can be purchased separately



# Vault UI Extension

- Navigate to Fusion Lifecycle item
  - Manually trigger jobs
  - Check if Item exists in Fusion Lifecycle
  - Sample Vault UI Extension available:
    - <https://github.com/coolOrangeLabs/powerflc-explorer-extension>
    - Sample code written in C#
    - Installer available
- Alternative
    - Vault Data Standard



# powerFLC – Components Overview

powerFLC	powerJobs Processor	Vault Job Processor	Vault UI
Configuration Manager  Cmdlets to interact with Fusion Lifecycle	Cmdlets to interact with Vault  Time Triggered Jobs	Hosts powerJobs  Custom Job Types	Sample Extension or Vault Data Standard
Workflow (Job) Scripts	Job Scripts		
Installed on the Job Processor machine	Installed on the Job Processor machine		Installed on all client machines

# powerFLC

## Installation and Configuration

# MFG Data Library – OTX Sample Vault

Available on Autodesk360 ChannelTech

- Advanced Vault Configuration
  - Extended set of UDPs
  - Extended set of Lifecycles
  - Extended set of Categories
  - Additional Custom Objects
  
- <https://channeltech.autodesk360.com/g/projects/2015031610404031/data/dXJuOmFkc2sud2lwchJvZDpmcy5mb2xkZXI6Y28uTVdIc3d3SVRSZi1vNzJfZ29Mb3BDQQ>



# Fusion Lifecycle App Store

## Installation and Configuration

- Install the “Vault Items and BOMs” Workspace
  - Administration – App Store – “Vault Connector - Items and BOMs”
- Adjust the permissions
  - Administration – Security – Roles

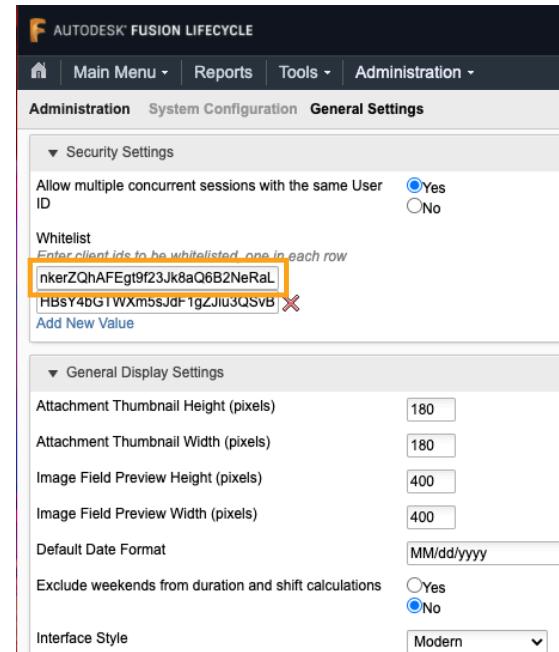
The screenshot shows the Autodesk Fusion Lifecycle Administration interface. At the top, there's a navigation bar with links for Main Menu, Reports, Tools, Administration, and a user profile for Christian Gessner. Below the navigation bar, the title "Administration" is followed by "Security". Under "Administration", it shows "Users: 8 Active 0 Inactive 0 Deleted", "Groups: 21 Groups", and "Roles: 79 Roles". On the right side, there are three buttons: "New User", "New Group", and "New Role". The main content area is titled "Roles [R/W]" and lists several roles with their descriptions and edit/delete options. Two specific roles are highlighted with an orange border: "Vault Items and BOMs [R/W]" and "Vault Items and BOMs [R]". The bottom of the screen features the Autodesk logo and the Fusion Lifecycle logo.

Role	Description	Tasks	Edit	Delete	Groups	Permissions
Tasks [R]	Read only access to Tasks WS	Tasks	Edit	Delete	Groups	Permissions
Training [R/W]	Read/write access to Training WS	Training	Edit	Delete	Groups	Permissions
User Administrator			Edit	Delete	Groups	Permissions
Vault Items and BOMs [R/W]	ReadWrite access to Vault Items and BOMs WS	Vault Items and BOMs	Edit	Delete	Groups	Permissions
Vault Items and BOMs [R]	Read access to Vault Items and BOMs WS	Vault Items and BOMs	Edit	Delete	Groups	Permissions

- Vault Items and BOMs [R/W] + Vault Items and BOMs [R]
  - Assigns Groups

# Forge App + Fusion Lifecycle Whitelist Configuration

- Why?
  - powerFLC uses 2-legged Authentication + FLC to trust the Forge App used by powerFLC
- How to create an App in Forge
  - <https://forge.autodesk.com/myapps>
  - “Create App”
    - APIs: Any (none of the listed APIs are used)
    - App Name: Name of your app
    - App description: Description of your app
    - Callback URL: Any valid URL (not used, e.g. <http://localhost>)
    - Result: **Client ID + Client Secret**
- Add Client ID to the Fusion Lifecycle tenant whitelist
  - Administration – System Configuration – General Settings



# powerJobs Processor + powerFLC

## Installation

### powerJobs Processor

- <http://download.coolorange.com>
- Run installer (Vault Job Processor)
- Components installed
  - powerJobs Scripting engine
  - powerJobs Commands (PowerShell)
  - powerJobs Sample scripts
  - powerJobs Client Extension
- Activate the product

### powerFLC

- <http://download.coolorange.com>
- Run installer (Vault Job Processor)
- Components installed
  - powerFLC Configuration Manager
  - powerFLC Commands (PowerShell)
  - Vault Items and BOMs workflow
- Activate the product

<http://download.colorange.com/>

## Enhance

### powerJobs Processor

[Website](#) [Documentation](#) [Knowledge Base](#)

Version	Vault 2021	Vault 2020	Vault 2019	Vault 2018	Vault 2017	Vault 2016	Vault 2015	Change Logs
21	<a href="#">21.0.8</a>	21.0.8	21.0.8	21.0.8 not supported				
20		20.0.8	20.0.8	20.0.8 not supported				
19			19.0.7	19.0.7	19.0.7 not supported			
18				18.0.12 not supported	18.0.12 not supported	18.0.12 not supported	18.0.12 not supported	

### powerFLC

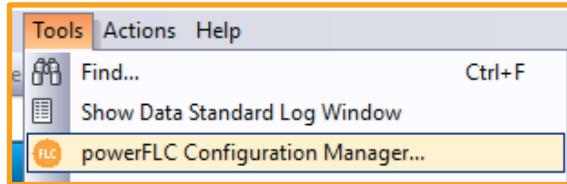
[Website](#) [Documentation](#) [Knowledge Base](#)

Version	Vault 2021	Vault 2020	Vault 2019	Change Logs
21	<a href="#">21.1.2</a>	21.1.2	21.1.2	

NFR licenses: [backoffice@colorange.com](mailto:backoffice@colorange.com)

# powerFLC Configuration Manager

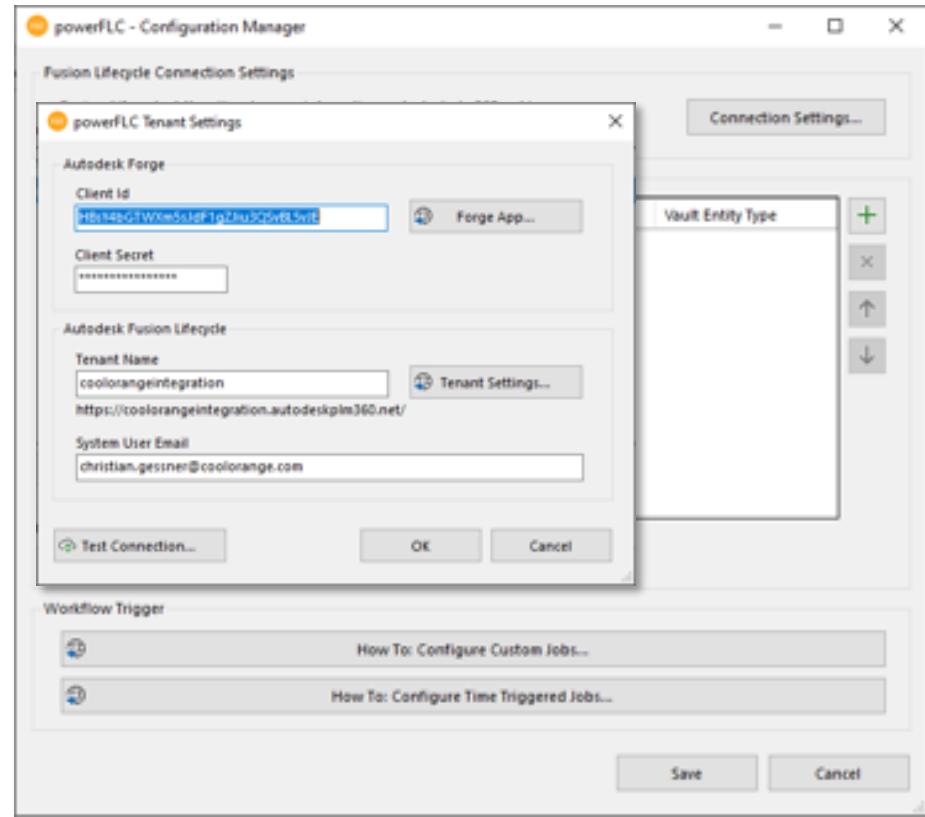
- Vault Tools Menu



- Tenant Settings

- Client ID
- Client Secret
- FLC Tenant name
- System user email

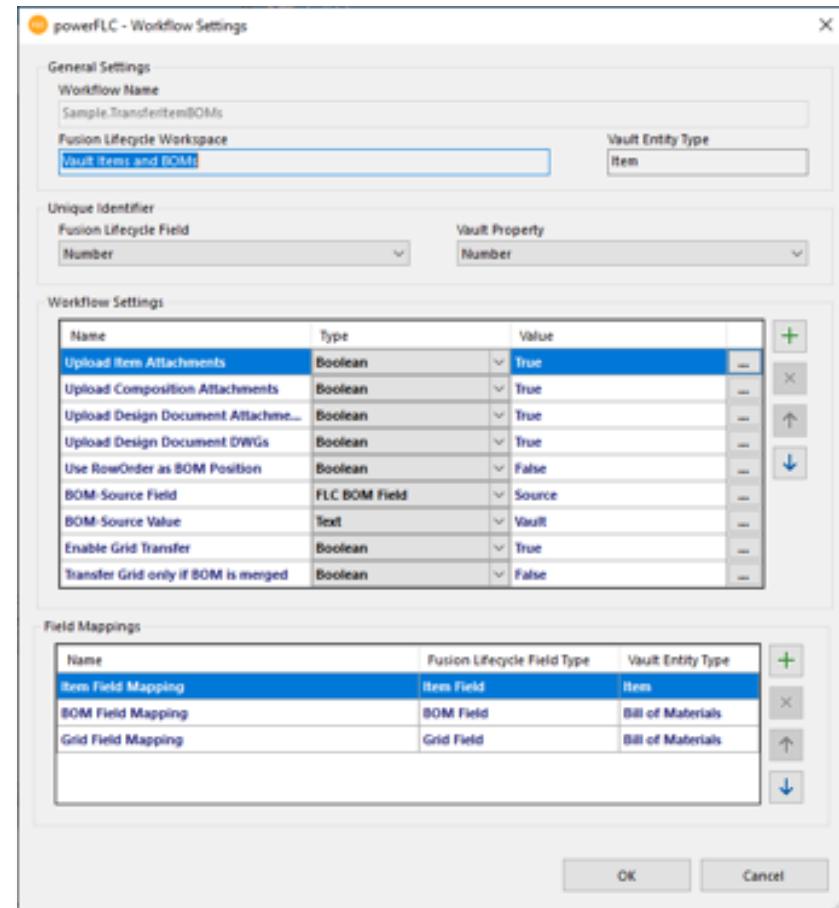
- Import “Items and BOM workflow”
  - *Sample.TransferItemBOMs.json*



# powerFLC

## Vault Items and BOMs workflow

- Workflow Name
- FLC Workspace and Vault Entity Type
- Unique Identifier
- Settings
- Mappings



# Vault Items and BOMs Workflow

## Settings: Attachment handling

### Upload Item Attachments:

General		History	Bill of Materials	Where Used	Change Order	View	ERP										
Revision:	Latest Work in Progress																
Number:	M178-1000																
Title:	TABLE, MAIN																
Description:	TABLE, MAIN																
Units:	Each																
Associated files:	<table border="1"> <thead> <tr> <th>File Name</th> <th>Version</th> </tr> </thead> <tbody> <tr> <td>M178-1000.idw</td> <td>4</td> </tr> <tr> <td>M178-1000.iam</td> <td>6</td> </tr> <tr> <td>M178-1000.dwg</td> <td>3</td> </tr> <tr style="background-color: #e0f2e0;"> <td> Assembly Instructions.pdf</td> <td>1</td> </tr> </tbody> </table>							File Name	Version	M178-1000.idw	4	M178-1000.iam	6	M178-1000.dwg	3	Assembly Instructions.pdf	1
File Name	Version																
M178-1000.idw	4																
M178-1000.iam	6																
M178-1000.dwg	3																
Assembly Instructions.pdf	1																

### Upload Composition Attachments:

General		History	Bill of Materials	Where Used	Change Order	View	ERP										
Revision:	Latest Work in Progress																
Number:	M178-1000																
Title:	TABLE, MAIN																
Description:	TABLE, MAIN																
Units:	Each																
Associated files:	<table border="1"> <thead> <tr> <th>File Name</th> <th>Version</th> </tr> </thead> <tbody> <tr> <td>M178-1000.idw</td> <td>4</td> </tr> <tr> <td> M178-1000.iam</td> <td>6</td> </tr> <tr> <td>M178-1000.dwg</td> <td>3</td> </tr> <tr style="background-color: #e0f2e0;"> <td> Assembly Instructions.pdf</td> <td>1</td> </tr> </tbody> </table>							File Name	Version	M178-1000.idw	4	M178-1000.iam	6	M178-1000.dwg	3	Assembly Instructions.pdf	1
File Name	Version																
M178-1000.idw	4																
M178-1000.iam	6																
M178-1000.dwg	3																
Assembly Instructions.pdf	1																

### Upload Design Document Attachments:

General		History	Bill of Materials	Where Used	Change Order	View	ERP										
Revision:	Latest Work in Progress																
Number:	M178-1000																
Title:	TABLE, MAIN																
Description:	TABLE, MAIN																
Units:	Each																
Associated files:	<table border="1"> <thead> <tr> <th>File Name</th> <th>Version</th> </tr> </thead> <tbody> <tr> <td>M178-1000.idw</td> <td>4</td> </tr> <tr> <td>M178-1000.iam</td> <td>6</td> </tr> <tr> <td>M178-1000.dwg</td> <td>3</td> </tr> <tr style="background-color: #e0f2e0;"> <td> Assembly Instructions.pdf</td> <td>1</td> </tr> </tbody> </table>							File Name	Version	M178-1000.idw	4	M178-1000.iam	6	M178-1000.dwg	3	Assembly Instructions.pdf	1
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M178-1000.idw	4																
M178-1000.iam	6																
M178-1000.dwg	3																
Assembly Instructions.pdf	1																

### Upload Design Document DWGs:

General		History	Bill of Materials	Where Used	Change Order	View	ERP										
Revision:	Latest Work in Progress																
Number:	M178-1000																
Title:	TABLE, MAIN																
Description:	TABLE, MAIN																
Units:	Each																
Associated files:	<table border="1"> <thead> <tr> <th>File Name</th> <th>Version</th> </tr> </thead> <tbody> <tr> <td>M178-1000.idw</td> <td>4</td> </tr> <tr> <td>M178-1000.iam</td> <td>6</td> </tr> <tr> <td> M178-1000.dwg</td> <td>3</td> </tr> <tr style="background-color: #e0f2e0;"> <td> Assembly Instructions.pdf</td> <td>1</td> </tr> </tbody> </table>							File Name	Version	M178-1000.idw	4	M178-1000.iam	6	M178-1000.dwg	3	Assembly Instructions.pdf	1
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M178-1000.idw	4																
M178-1000.iam	6																
M178-1000.dwg	3																
Assembly Instructions.pdf	1																

History		Uses	Where Used	Change Order	Preview	ER
Latest	Engineering Released (PDM)					
File Name		/	Revision			
M178-1000.iam			A			
Attachments						
M178-1000.iam.dwg						

History		Uses	Where Used	Change Order	Preview	
Latest	Engineering Released (PDM)					
File Name		/	Revision			
M178-1000.idw			A			
Attachments						
M178-1000.idw.dwf						
M178-1000.idw.pdf						



# Vault Items and BOMs Workflow

## Settings: BOM Position source

### Use RowOrder as BOM Position

Bill of Materials					
Latest		Work in Progress		Today	
				Multi-Level	
Number	Row Order	/	Position Number	Item	Unit Qty
M178-1000	-	/	-	-	-
M178-1100	1	/	1	1	1 Each
M178-1001	2	/	2	1	1 Each
M178-1003	3	/	3	4	32 Inch
M178-1003	4	/	4	2	26,85039 Inch
M178-1003	5	/	5	2	68,85039 Inch
20-058	6	/	6	28	1 Each
24-220-8	7	/	7	20	1 Each
20-004	8	/	8	12	1 Each
21-009	9	/	9	4	1 Each
24-706-8	10	/	10	4	1 Each
M178-1007	11	/	11	1	1 Each
21-092	12	/	12	2	1 Each
24-118-8	13	/	13	8	1 Each
21-002	14	/	14	4	1 Each
24-125-10	15	/	15	4	1 Each
24-708-10	16	/	16	4	1 Each
18-813	17	/	18	1	1 Each

Use RowOrder as BOM Position   Boolean   False

<input type="checkbox"/>	1.2	M178-1001 - TABLE TOP, WORKSTATION [REV:w]
<input type="checkbox"/>	1.3	M178-1003 - M178-1005 [REV:w]
<input type="checkbox"/>	1.6	20-058 - 20-058 [REV:w]
<input type="checkbox"/>	1.7	24-220-8 - 24-220-8 [REV:w]
<input type="checkbox"/>	1.8	20-004 - UNIVERSAL FASTENER SET, 40 SERIES [REV:w]
<input type="checkbox"/>	1.9	21-009 - 21-009 [REV:w]
<input type="checkbox"/>	1.10	24-706-8 - 24-706-8 [REV:w]
<input type="checkbox"/>	1.11	M178-1007 - WORKSTATION, LOWER SHELF [REV:w]
<input type="checkbox"/>	1.12	21-092 - CASTER, SWIVEL, WHEEL BRAKE [REV:w]
<input type="checkbox"/>	1.13	24-118-8 - 24-118-8 [REV:w]
<input type="checkbox"/>	1.14	21-002 - 21-002 [REV:w]
<input type="checkbox"/>	1.15	24-125-10 - 24-125-10 [REV:w]
<input type="checkbox"/>	1.16	24-708-10 - WASHER, SPRING, PARKER IPS, M10 [REV:w]
<input type="checkbox"/>	1.17	21-091 - CASTER, SWIVEL [REV:w]
<input type="checkbox"/>	1.18	18-813 - 18-813 [REV:w]



# Vault Items and BOMs Workflow

## Settings: Manually added BOM row recognition

BOM-Source Field	FLC BOM Field	Source
BOM-Source Value	Text	Vault

Edit
Add
Remove


...

View:
Default View

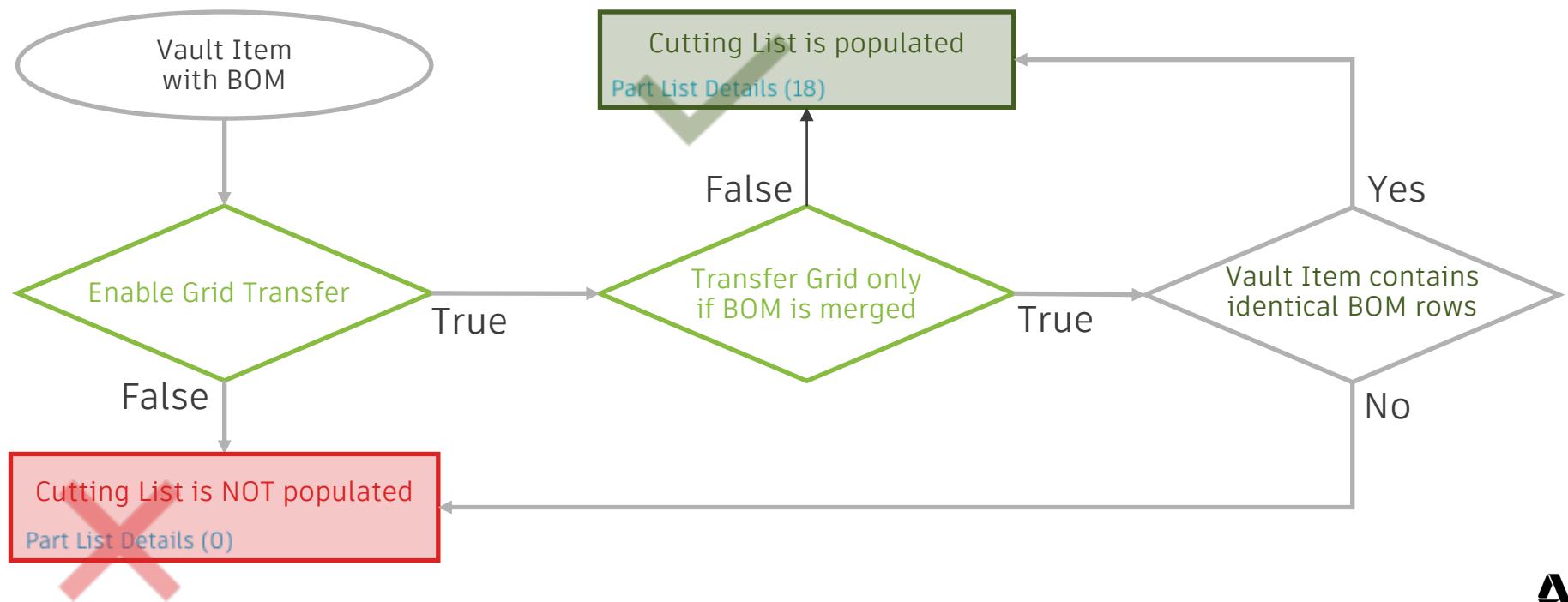
Default View as of Today using the Released Revisions configuration

Revision	Lifecycle	Status	Quantity	Units	BOM Source Field:	Source	Qty Pos	Supplier / Part N...
Working	1 0	Working	Unreleased	20.0	EA	BOM Source Value:	Vault	20.00000
Working	1 0	Working	Unreleased	12.0	EA	8	Vault	12.00000
Working	1 0	Working	Unreleased	4.0	EA	9	Vault	4.00000
Working	1 0	Working	Unreleased	4.0	EA	10	Vault	4.00000
Working	1 0	Working	Unreleased	1.0	EA	11	Vault	1.00000
Working	1 0	Working	Unreleased	2.0	EA	12	Vault	2.00000
Working	1 0	Working	Unreleased	8.0	EA	13	Vault	8.00000
Working	1 0	Working	Unreleased	4.0	EA	14	Vault	4.00000
Working	1 0	Working	Unreleased	4.0	EA	15	Vault	4.00000
Working	1 0	Working	Unreleased	4.0	EA	16	Vault	4.00000
Working	1 0	Working	Unreleased	2.0	EA	18	Vault	2.00000
Working	1 0	Working	Unreleased	4.0	EA	17	Vault	4.00000

# Vault Items and BOMs Workflow

## Settings: Populate Cutting List (Grid)

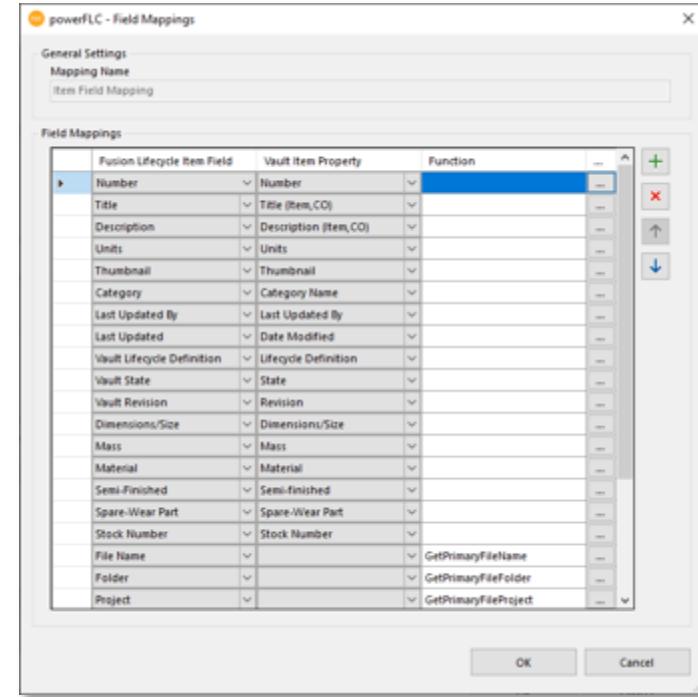
Enable Grid Transfer	Boolean	True
Transfer Grid only if BOM is merged	Boolean	False



# Vault Items and BOMs Workflow

## Field Mappings

- Multiple Mappings for
  - FLC Item fields <> Vault item UDPs
  - FLC BOM fields <> Vault BOM UDPs
  - FLC Grid fields <> Vault BOM UDPs
- Only fields with identical types can be mapped
- Functions [...] for values that need to be calculated
  - Example: Thin- or Thick Client Links
  - Example: Server Name or Vault Name
  - Example: UDPs of primary attached files
- Own functions can be added to:  
*C:\ProgramData\coolOrange\powerJobs\Modules\coolOrange.powerFLC.Workflows.MappingFunctions.psm1*

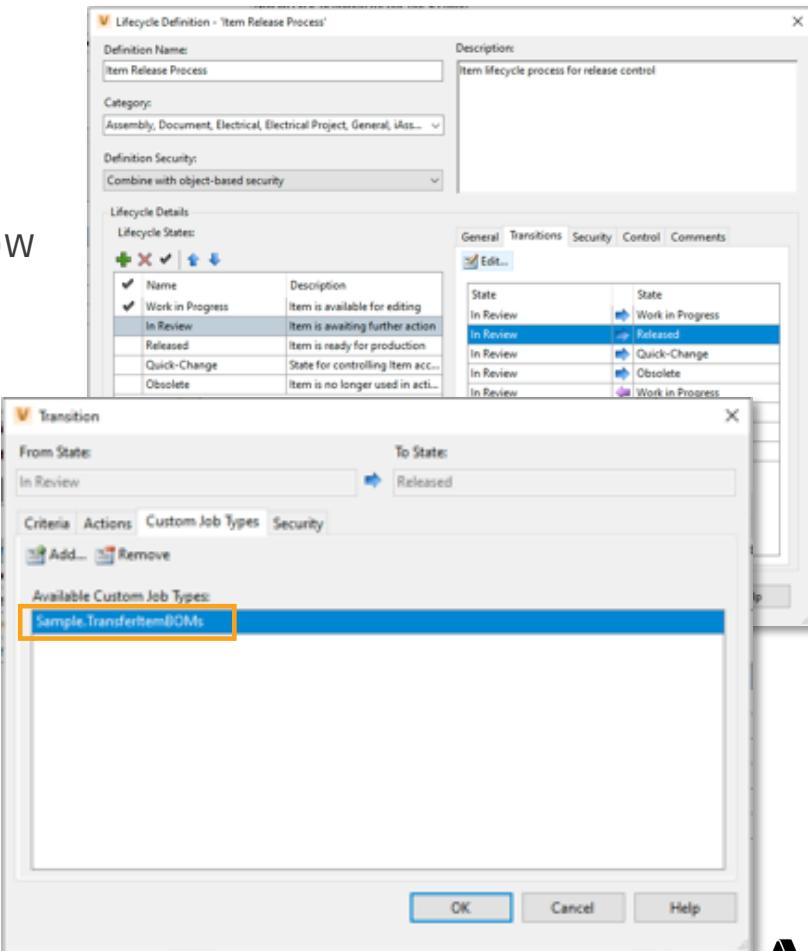


# Vault Configuration

## Custom Job Types to trigger a workflow

A “Custom Job Type” is used to trigger the workflow on an item state change

- Add the job to a transition
  - Vault Menu: Tools – Administration – Vault Settings
  - Tab: Behaviors – Lifecycles...
  - Edit a Lifecycle definition (e.g. Item Release Process)
  - In the “Transitions” tab, edit the transition
  - Tab: Custom Job Types
  - Add the Job “*Sample.TransferItemBOMs*”

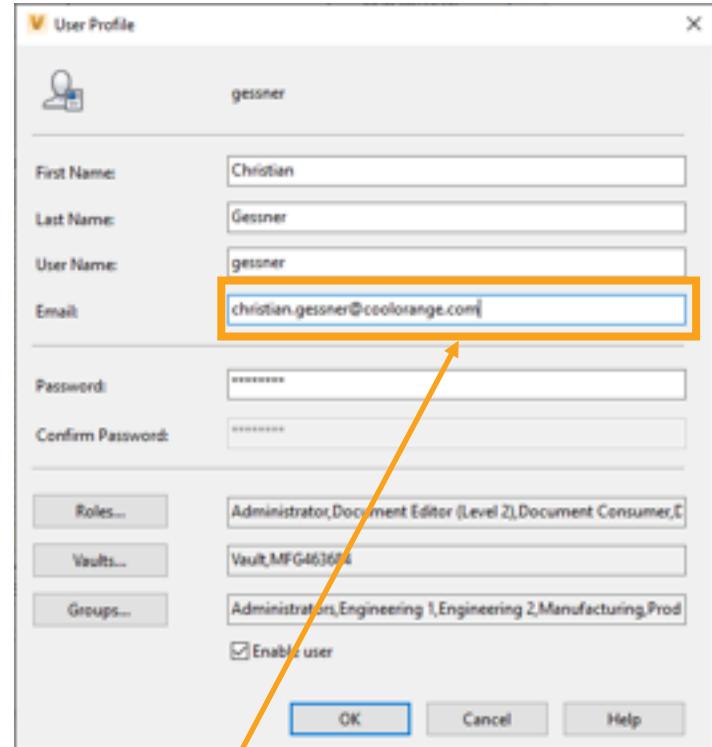


# Vault Configuration

## Vault User Configuration

The email address of the Vault user who changed the state is used to login to Fusion Lifecycle

- Configure Vault user email addresses
  - Vault Menu: Tools – Administration – Global Settings
  - Tab: Security – Manage Users...
  - Edit the selected user (double click)
  - Provide the Email that is configured in Fusion Lifecycle for that user

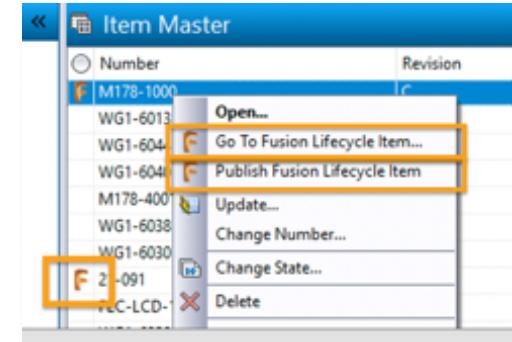


ACTIVE	Mapped			gessnec	Christian	Gessner		christian.gessner@colorange.com	coolOrange S.r.l.	<a href="#">Edit Groups</a>
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# Vault Explorer Extension

## Installation and Configuration

- Installer + Source code available
- Download from GitHub:  
<https://github.com/coolOrangeLabs/powerflc-explorer-extension/releases>
- Command “Publish Fusion Lifecycle Item” can be customized
  - The Job that is triggered can be changed:



```

1  <?xml version="1.0"?>
2  <configuration>
3    <appSettings>
4      <add key="Item_JobType" value="Sample.TransferItemBOMs"/>
5      <add key="Item_AttributeName" value="Urn"/>
6      <add key="Item_AttributeNamespace" value="FLC.ITEM"/>
7    </appSettings>
8    <startup useLegacyV2RuntimeActivationPolicy="true">
9      <supportedRuntime version="v4.0" sku=".NETFramework,Version=v4.5"/>
10     </startup>
11   </configuration>

```

C:\ProgramData\Autodesk\Vault <VERSION>\Extensions\powerFLC.ExplorerExtension\powerFLC.ExplorerExtension.dll.config



# Summary

## How to install a demo environment

- **Forge**
  - Create Forge App
- **Fusion Lifecycle**
  - Configure to trust the Forge App (Whitelist)
  - Install “Vault Items and BOMs” FLC App
  - Configure the workspace permissions
- **Vault Server**
  - Install / use the “OTX Sample Vault”
- **Vault Job Processor**
  - Download + Install powerJobs Processor
  - Download + Install powerFLC
  - Configure the Workspace (Client ID + Secret)
  - Import and configure the workflow
  - Configure the Vault state transitions
- **Vault Client**
  - Download + deploy the client extension (optional)



# powerFLC

## Additional Resources

# Additional workflows

- Workflows available on GitHub:  
<https://github.com/coolOrangeLabs/powerflc-samples>
- Workflows to come:
  - Change Management workflow
    - Synchronizes Fusion Lifecycle Change Orders or Change Tasks with Vault ECOs
    - Automatically creates ECOs in Vault
    - Automatically assigns Vault records (items) to the Vault ECO
    - Automatically downloads attachments from FLC and adds it to the Vault ECO
    - Automatically changes the FLC Change Order/Change Task state once a Vault ECO is closed
  - More workflows under investigation



<https://www.autodesk.com/autodesk-university/class/Joint-Effort-Vault-and-Fusion-Lifecycle-New-Dream-Couple-2020>

AUTODESK UNIVERSITY

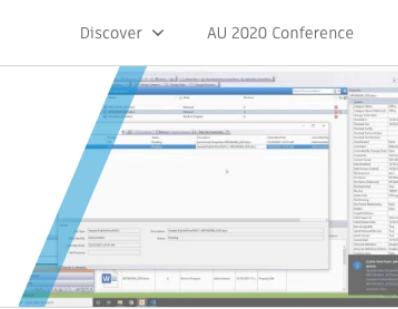
Discover ▾ AU 2020 Conference

VIRTUAL 2020 VAULT PROFESSIONAL CLOUD SERVICES CLOUD COLLABORATION

INSTRUCTIONAL DEMO MFG463684

## Joint Effort: Vault and Fusion Lifecycle As the New Dream Couple

Christian Gessner



Share Comment Bookmark Recommend (1) + Follow

NOV 18 @ 9:30 PM

Live Classroom Q&A

Add to calendar

Join Now \*

Overview

### Description

When used together, Vault Professional software and Fusion Lifecycle software provide a combined solution that is the best of all worlds for product data management (PDM) and product lifecycle management (PLM). While Vault runs on-prem to keep your CAD data safe behind your firewall, Fusion Lifecycle is cloud-based for flexibility and ease of deployment. With powerFLC (Vault Fusion Lifecycle connector), coolOrange offers an easy-to-use and flexible tool to combine Fusion Lifecycle and Vault processes. Previous versions of powerFLC included predefined workflows, and with the latest version of powerFLC, it is even possible to create custom workflows to synchronize any data between Vault and Fusion Lifecycle. This class will demonstrate the advantages of using both products together and show some of the endless possibilities of this integration.





# Documentation and Support

- powerFLC Documentation  
<https://www.coolorange.com/wiki/doku.php?id=powerflc>
- powerJobs Processor Documentation  
[https://www.coolorange.com/wiki/doku.php?id=powerjobs\\_processor](https://www.coolorange.com/wiki/doku.php?id=powerjobs_processor)
- powerFLC Solution Portal  
<https://support.coolorange.com/support/solutions/22000107360>
- powerJobs Processor Solution Portal  
<https://support.coolorange.com/support/solutions/22000097987>
- coolOrange Helpdesk  
<https://support.coolorange.com/support/home>
- Feature Request Forum  
<https://support.coolorange.com/support/discussions/forums/22000188644>

# *Q & A*

# *Feedback*



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