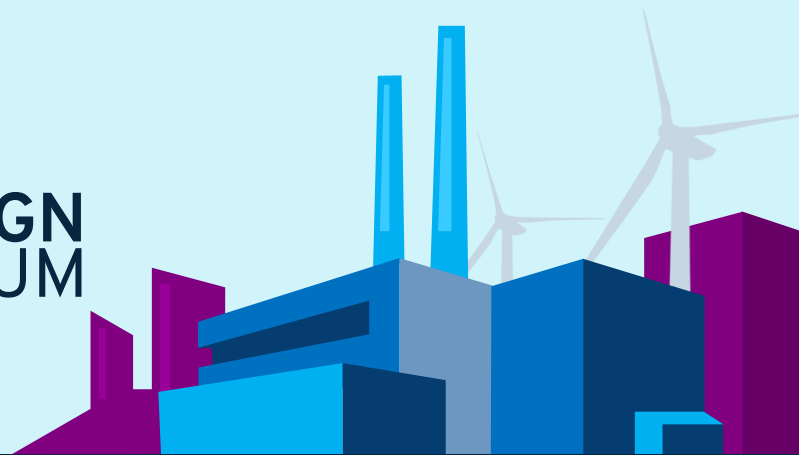




2023
INDUSTRI&DESIGN
FORUM



Optimering af dine arbejdsprocesser Plant Design

Del 2 – Spor 3

Del 2 - Spor 3

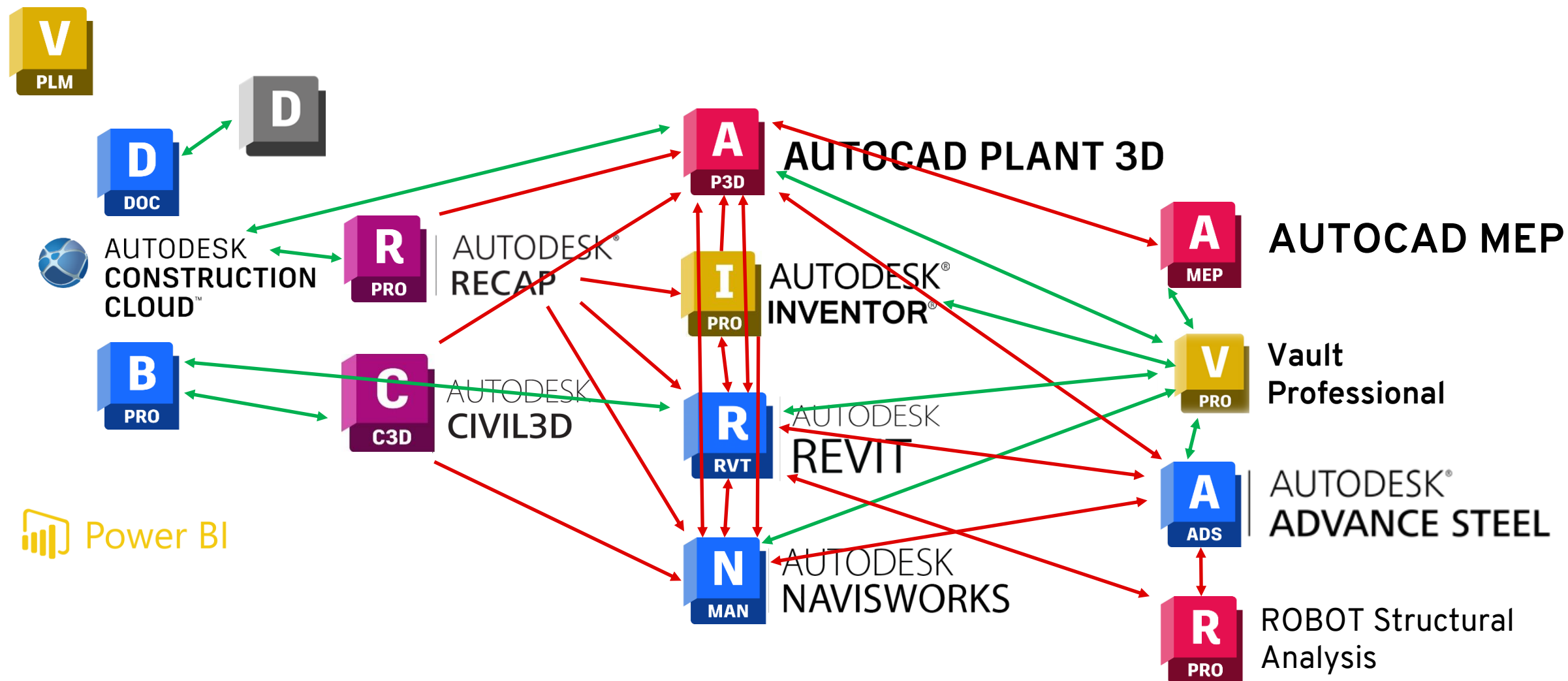
Her i anden del dykker vi ned i værktøjerne, der understøtter ”multidisciplinært projektarbejde”.

Herunder emner som forbedring af samspillet mellem Inventor, Plant 3D og Revit, understøttelse af styret filoprettelse, Vault LifeCycle-workflow, overvågning af importeret equipment og præsentation af de seneste funktioner: Export to native AutoCAD og en udvidet SpecViewer.

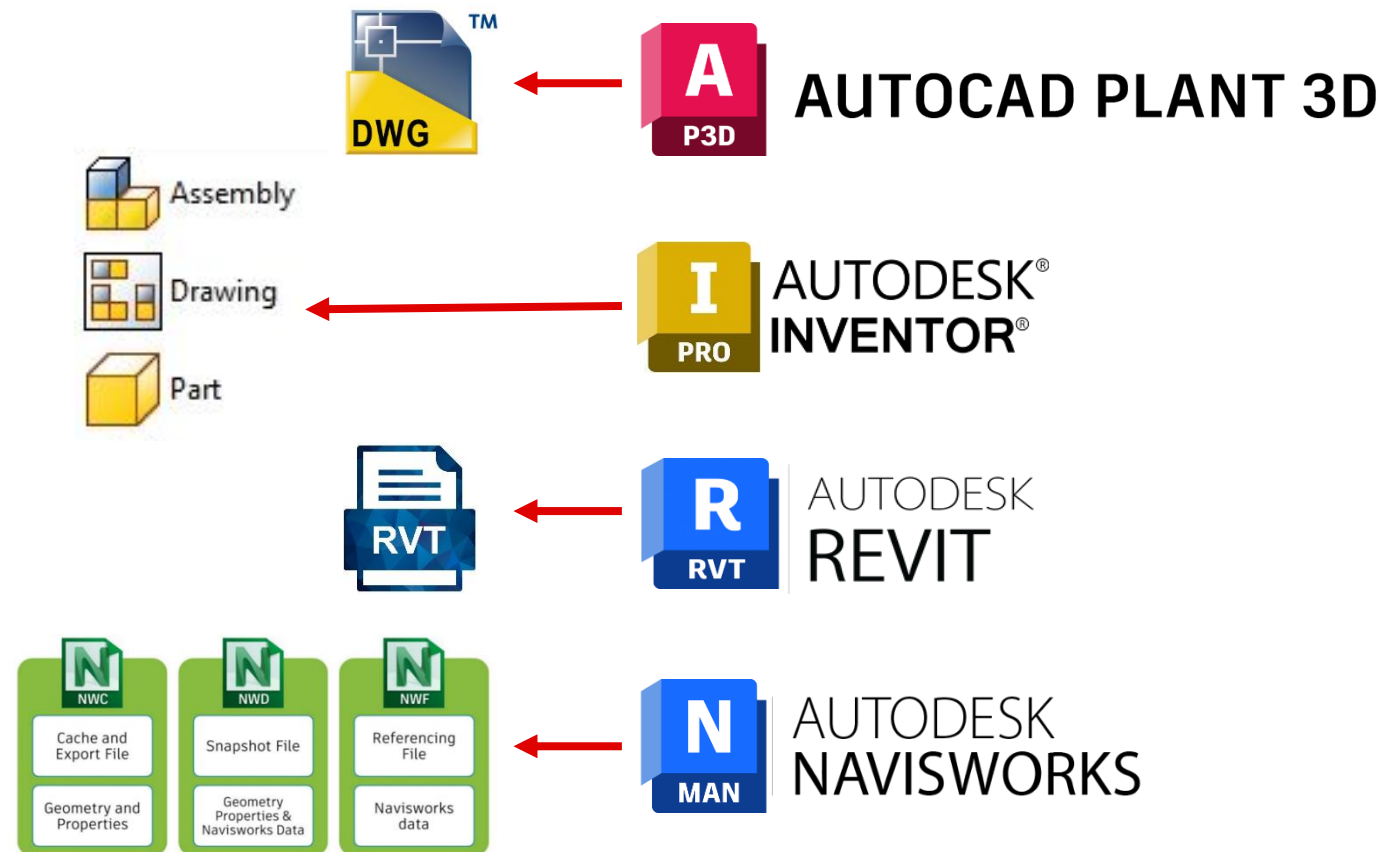
Derudover vil vi se på, hvordan NTI TOOLS Plant kan optimere arbejdet i AutoCAD Plant 3D. Vi viser de forskellige funktioner som gør hverdagen lettere for brugerne, sparer tid og som sikrer et bedre og mere ensartet output fra P&ID-diagrammerne og Plant 3D-modellen..



AUTODESK Holdet



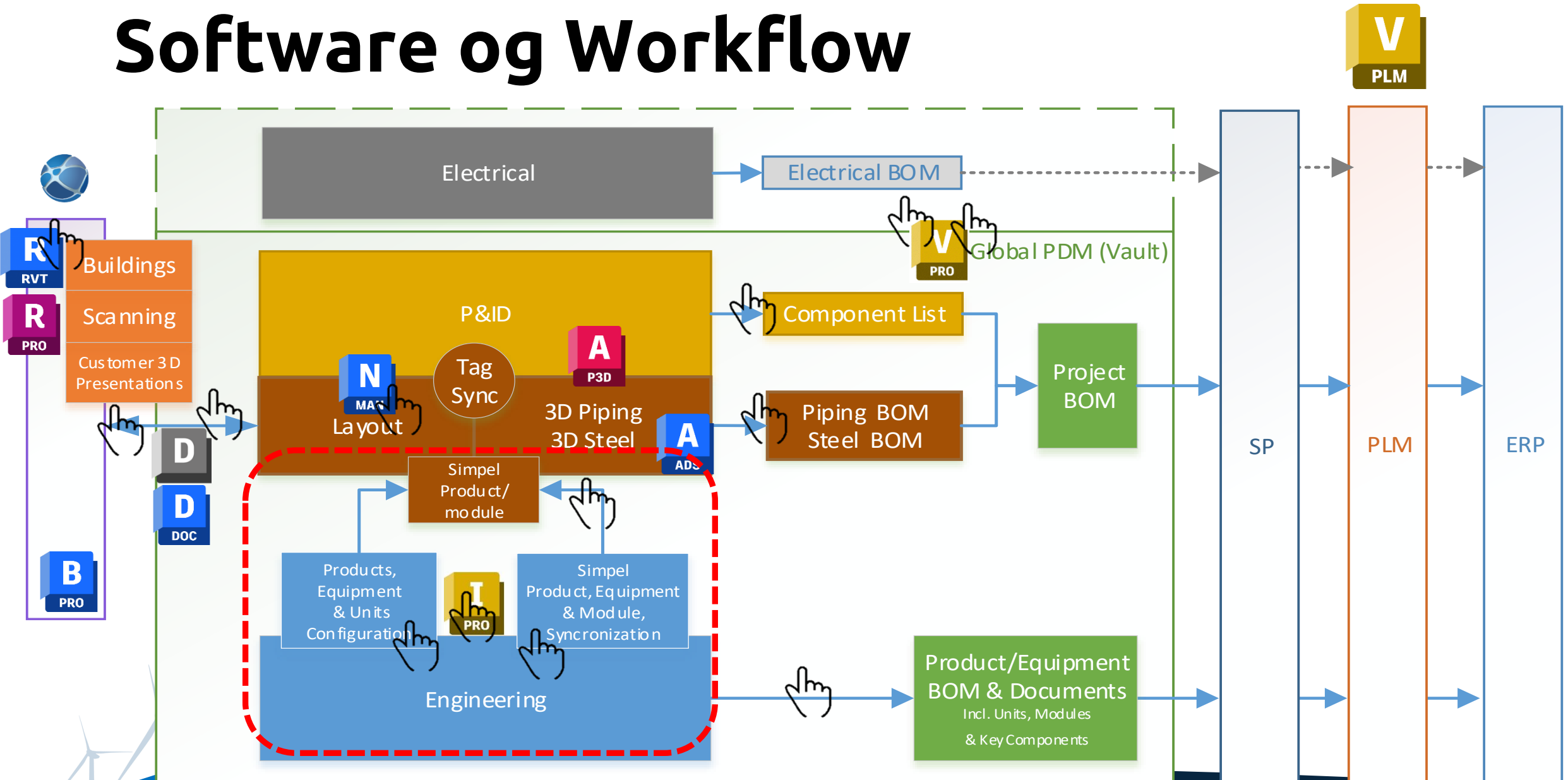
AUTODESK Holdet



Hvilke bolde spilles der med?

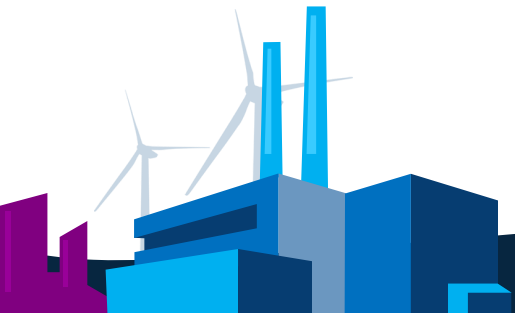


Software og Workflow



Inventor & Plant 3D

- Inventor benyttes som leverandør af f.eks. Equipment og stål konstruktioner, units mm. til AutoCAD Plant 3D.
- Simplificering er et issue
- Tilslutnings informationer og properties kan leveres med fra Inventor af (ADSK) til Plant 3D.
- Processen kan håndteres manuelt og kan automatiseres via Vault Pro.



Release Process -

Layout



File Handling
Development
Construction

NTI For Inventor Property Editor

Apply Sheet Metal - Se

Top level NTI-75000853.ipt

C:\WF\Designs\3. Brokk Arm\NTI-75000853.ipt

Part - Group

Title NTI-75000853

Description Plate

NTI For Inventor Documentation Status

No filter

NTI-75000850.iam

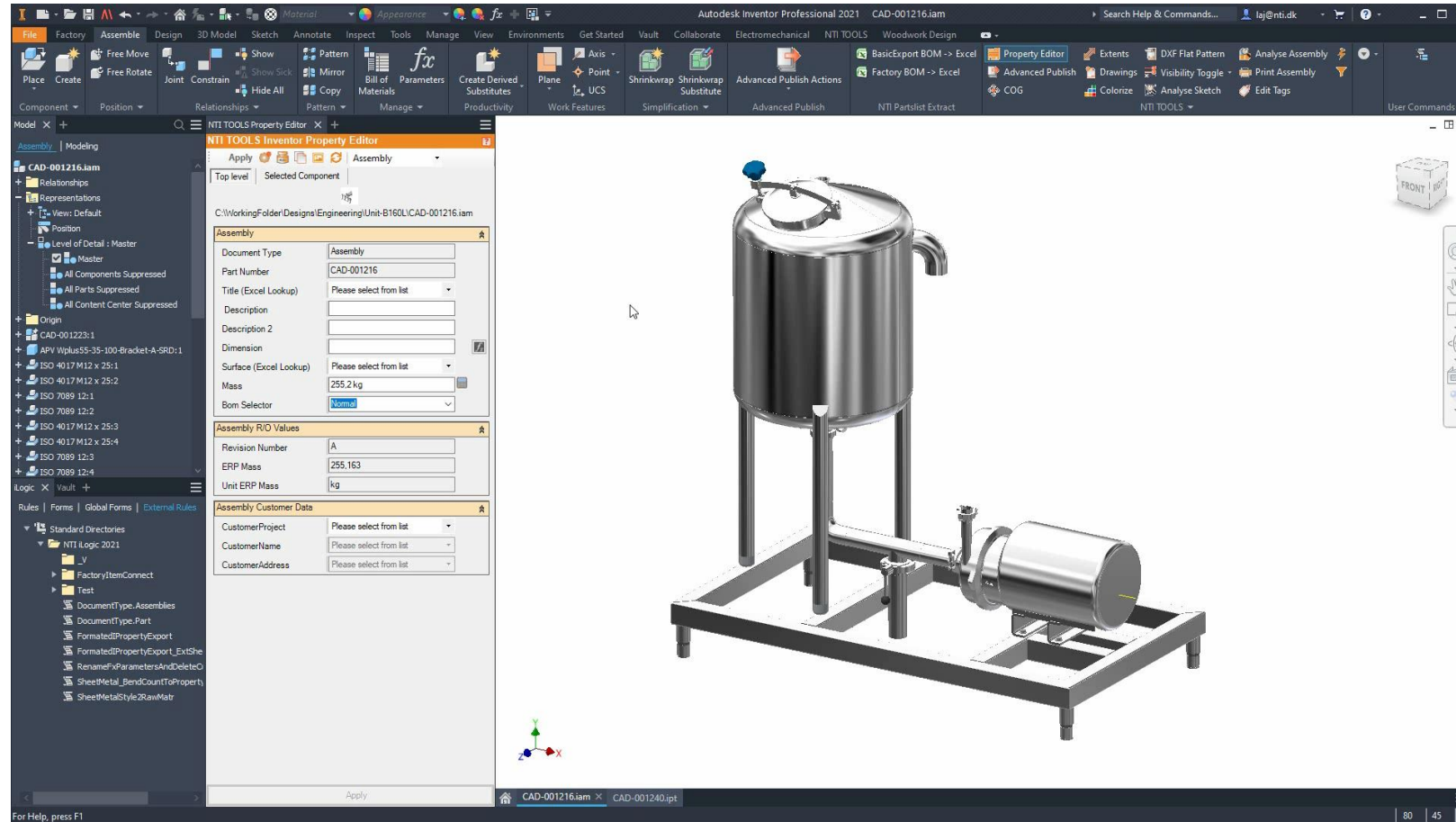
Pos	thumb	Qty	PartNumber	Title	Description	Drawing file	PDF	DXF	Excel
Top		1	NTI-75000850	Brokk_Arm	Brokk Global	NTI-75000850.idw	NTI-75000850.pdf		
1		1	NTI-75000852	Arminfästning svängmotor		NTI-75000852.idw	NTI-75000852.pdf		
1.1		1	NTI-75000861	Bottenplåt	Plade for 1212	NTI-75000861.idw	NTI-75000861.pdf	NTI-75000861_0494x0494_Rev_A.dxf	
1.3		1	NTI-75000863	Förstyvning	Plate	NTI-75000863.idw	NTI-75000863.pdf	NTI-75000863_0122x0417_Rev_A.dxf	
1.4		1	NTI-75000862	Skyddsplåt svängmotor		NTI-75000862.idw	NTI-75000862.pdf	NTI-75000862_0035x0241_Rev_A.dxf	
1.5		1	NTI-75000860	Sidoplåt vänster		NTI-75000860.idw		NTI-75000860_0227x0339_Rev_A.dxf	
1.6		1	NTI-75000859	Sidoplåt höger		NTI-75000859.idw	NTI-75000859.pdf	NTI-75000859_0227x0339_Rev_A.dxf	
2		1	NTI-75000855	arm lower	arm lower	NTI-75000855.idw	NTI-75000855.pdf		
2.1		1	NTI-75000870	NTI-75000870		NTI-75000870.idw			
2.2		4	NTI-75000872	NTI-75000872		NTI-75000872.idw	NTI-75000872.pdf	NTI-75000872_0157x0312_Rev_A.dxf	
2.3		2	NTI-75000871	End Plate	End Plate	NTI-75000871.idw	NTI-75000871.pdf	NTI-75000871_0070x0070_Rev_A.dxf	
3		1	NTI-75000856	arm mid	arm mid	NTI-75000856.idw			
3.1		1	NTI-75000875	NTI-75000875		NTI-75000875.idw	NTI-75000875.pdf		
3.2		2	NTI-75000873	NTI-75000873		NTI-75000873.idw	NTI-75000873.pdf		

variant files handling
(Check In / Out)

Firma 4 PDH

Apply

Release Process - Engineering -> Plant/Layout

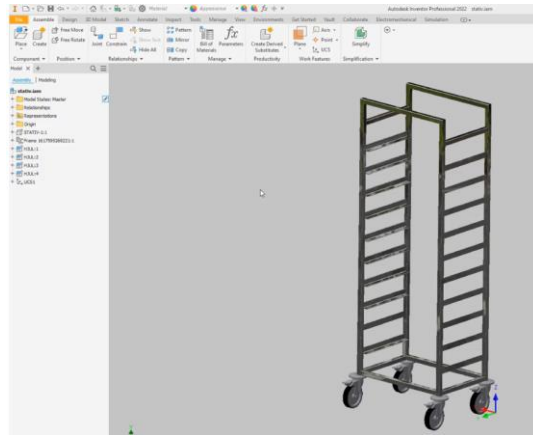


Data workflow fra Inventor til Revit

On-demand webinars

Nu kan du se vores tidligere afholdte webinarer, lige når det passer dig.

Alt du skal gøre for at få adgang er at vælge et webinar og tilmelde dig. Herefter sender vi dig et link til webinarret.



Inventor

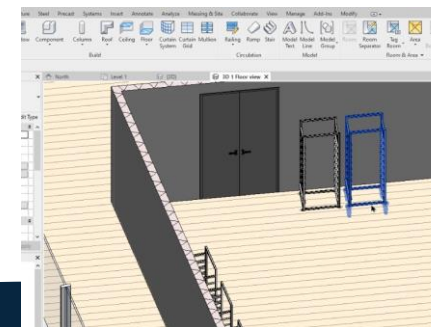
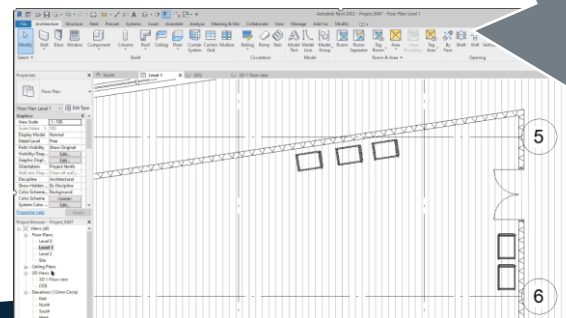
Remove details

Shrinkwrap

Tilføj BIM
detaljer

Export Revit

Revit



*Hvad med
Revit & Inventor*



WEBINAR BYGGE-LEVERANDØR

Arbejder du med - eller
modtager - produkter til
byggeriet?

14. apr 2021

Arbejder du med - eller har
interesse for - produktion af
byggevarer til byggeriet, bør du
opleve de muligheder, der er for
udveksling af data mellem Revit og
Inventor på en nem måde.

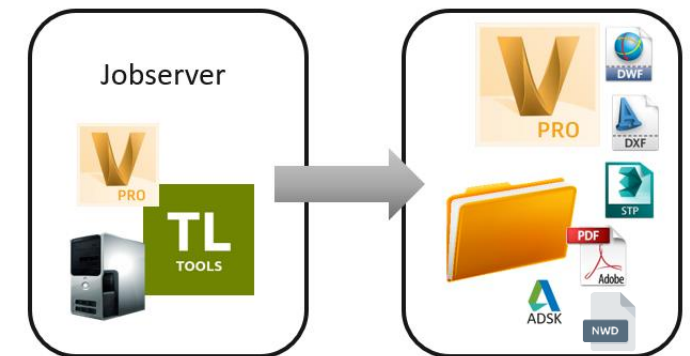
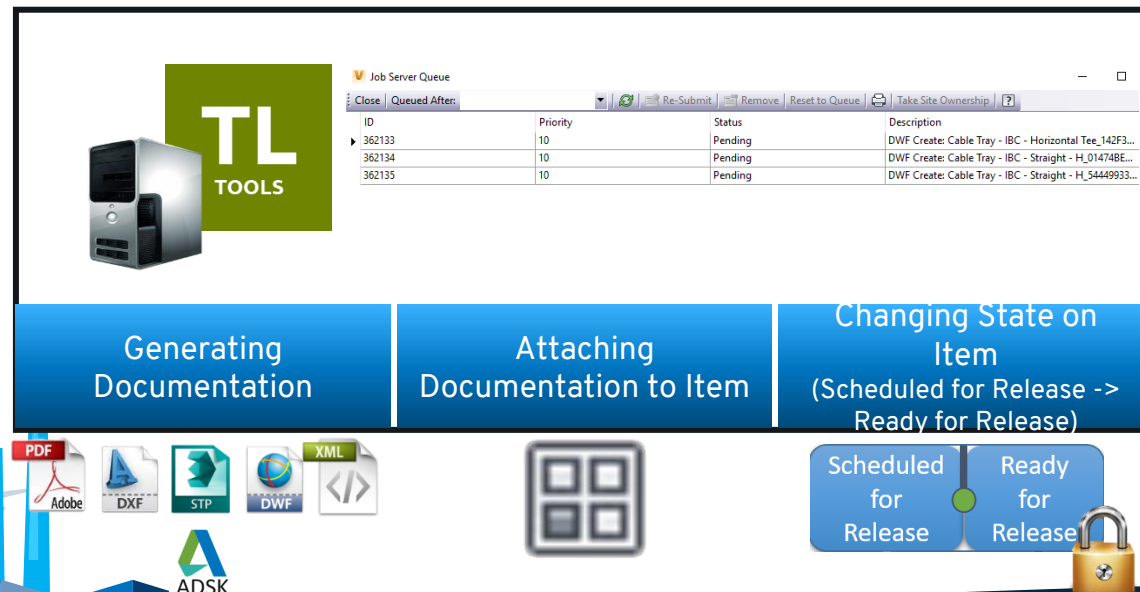
[Se optagelsen her](#)

Engineering Workflow: The 3 States



NTI Vault Publish (Jobserver)

- Inventor Drawing -> PDF, DWF
- Inventor Sheet Metal -> DXF, STP, DWF
- Inventor Part + Property Criteria -> ADSK

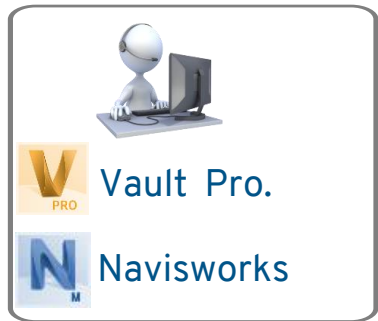


Architecture in NTI Plant The concept of Vault

Inventor CAD Client



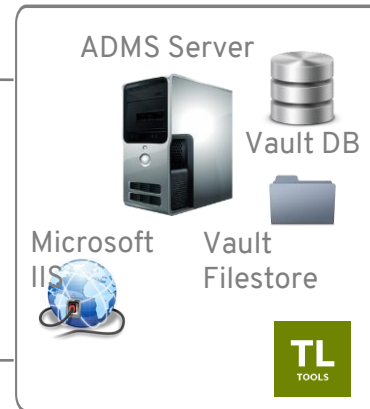
Project Manager Client



Plant 3D CAD Client



Vault Server



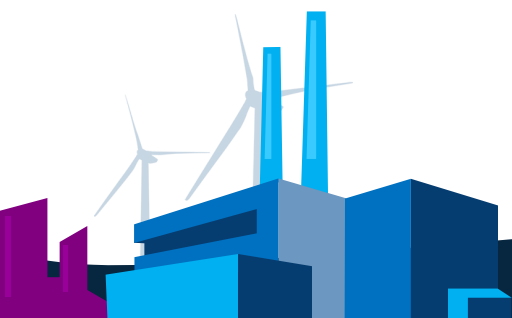
JobProcessor



Plant 3D Equipment

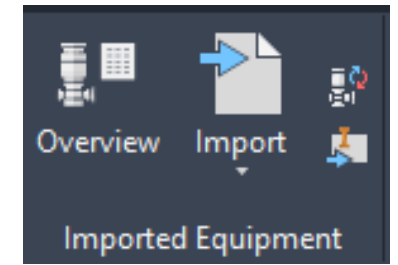


New Revision



NTI TOOLS PLANT

Imported Equipment

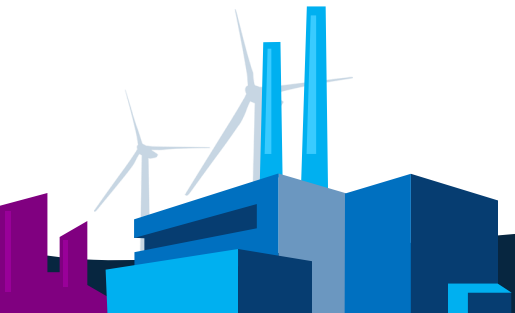


NTI TOOLS Plant									
Imported Equipment									
Block Name	Source File	Count	Registered	Status	Update	Delete link	Find		
L3-Udstyr 037-00011-14	C:\Users\pdh\OneDrive - NTI A S\Dokumenter\Kunder\Dupont\Modtaget Filer\31-08-2020\037-00011-14.stp	2	18-08-2021 09:21:11	Ok	Update	Delete	Find		
L3-Udstyr PM_ASM_AGG	C:\Users\pdh\OneDrive - NTI A S\Dokumenter\Kunder\Dupont\Modtaget Filer\24-08-2020\CBMD_032200+_132S+_S303.stp	1	15-09-2021 09:17:23	Ok	Update	Delete	Find		
*UIREF125	C:\Users\pdh\OneDrive - NTI A S\CAD\NTI TOOLS Plant\Sample Files\Equipment\ADSK Filer\Vessel.adsk	1	20-09-2021 11:10:06	Ok	Update	Delete	Find		
L3-Udstyr Vejetank	C:\Users\pdh\OneDrive - NTI A S\CAD\NTI TOOLS Plant\Sample Files\Equipment\Inventor\Vejetank.ipt	2	20-09-2021 11:24:24	Ok	Update	Delete	Find		
*UIREF127	C:\Users\pdh\OneDrive - NTI A S\CAD\NTI TOOLS Plant\Sample Files\Equipment\ADSK Filer\Vessel.adsk	1	20-09-2021 11:10:06	Ok	Update	Delete	Find		
*UIREF134	C:\Users\pdh\ACCDocs\NTI_AS\Intern_test NTI Plant\Project Files\Plant 3D Equipment\Projekt 4711\OilTank-Simplify_R3.adsk	1	21-02-2022 11:46:32	Ok	Update	Delete	Find		
L3-Udstyr Tankgård LPG Tank	C:\Users\pdh\OneDrive - NTI A S\CAD\NTI TOOLS Plant\Sample Files\Equipment\Inventor\LPG Tank.ipt	1	20-09-2021 11:25:30	Ok	Update	Delete	Find		
L3-Udstyr Tankgård 20x08x08 SHIPPING CONTAINER	C:\Users\pdh\OneDrive - NTI A S\CAD\NTI TOOLS Plant\Sample Files\Equipment\SolidWorks\20x08x08 SHIPPING CONTAINER Units in Meter.SLDPR	1	20-09-2021 11:14:17	Ok	Update	Delete	Find		
L3-Udstyr Tankgård Silo-tank_100m3	C:\Users\pdh\OneDrive - NTI A S\CAD\NTI TOOLS Plant\Sample Files\Equipment\Inventor\Silo-tank_100m3.ipt	1	20-09-2021 11:22:25	Ok	Update	Delete	Find		
L3-Udstyr Tankgård Silo-tank_50m3	C:\Users\pdh\OneDrive - NTI A S\CAD\NTI TOOLS Plant\Sample Files\Equipment\Inventor\Silo-tank_50m3.ipt	1	20-09-2021 11:23:05	Ok	Update	Delete	Find		
L3-Udstyr Tankgård Silo-tank_250m3	C:\Users\pdh\OneDrive - NTI A S\CAD\NTI TOOLS Plant\Sample Files\Equipment\Inventor\Silo-tank_250m3.ipt	1	20-09-2021 11:23:15	Ok	Update	Delete	Find		
L3-Udstyr Tankgård Storagetank	C:\Users\pdh\OneDrive - NTI A S\CAD\NTI TOOLS Plant\Sample Files\Equipment\Inventor\Storagetank.ipt	4	20-09-2021 11:25:05	Ok	Update	Delete	Find		

Close

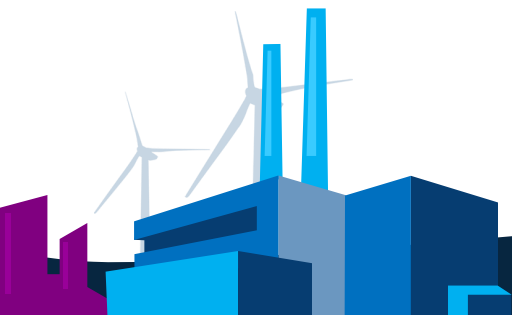
Workflow – Importere udstyr til et Plant 3D layout

1. Importere den modtaget 3D model fil.
2. Placere det importerede i layoutet (move + rotate)
3. Konvertere det importerede til Plant Equipment (udstyr)
4. Vælge Equipment klasse
5. Vælg indsættelses punkt
6. Tilføj TAGno og evt. andre Meta data til udstyret
7. Tilføj Nozzles til udstyret, inkl. type, tryktrin, størrelse.



Udfordring:

- Der kommer en ny model fil med ændringer.
- Eller endnu værre:
 - Der kommer en ny model fil ændringer, men vi opdager det ikke !



FORFRA!

Opdatere udstyr i et Plant 3D layout



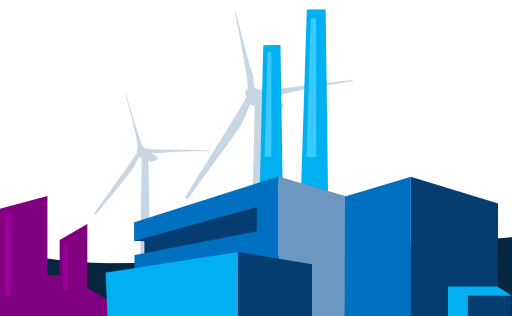
1. Husk / notere alle metadata
2. Husk / notere alle nozzels data
3. Slet den "gamle model" (alle steder)
4. Importere den opdateret / ændret model fil.
5. Placere det importerede i layoutet (move + rotate)
6. Konvertere det importerede til Plant Equipment (udstyr)
7. Vælg Equipment klasse
8. Vælg indsættelses punkt
9. Tilføj TAGno og andre Meta data til udstyret
10. Tilføj Nozzles til udstyret, inkl. type, tryktrin, størrelse.



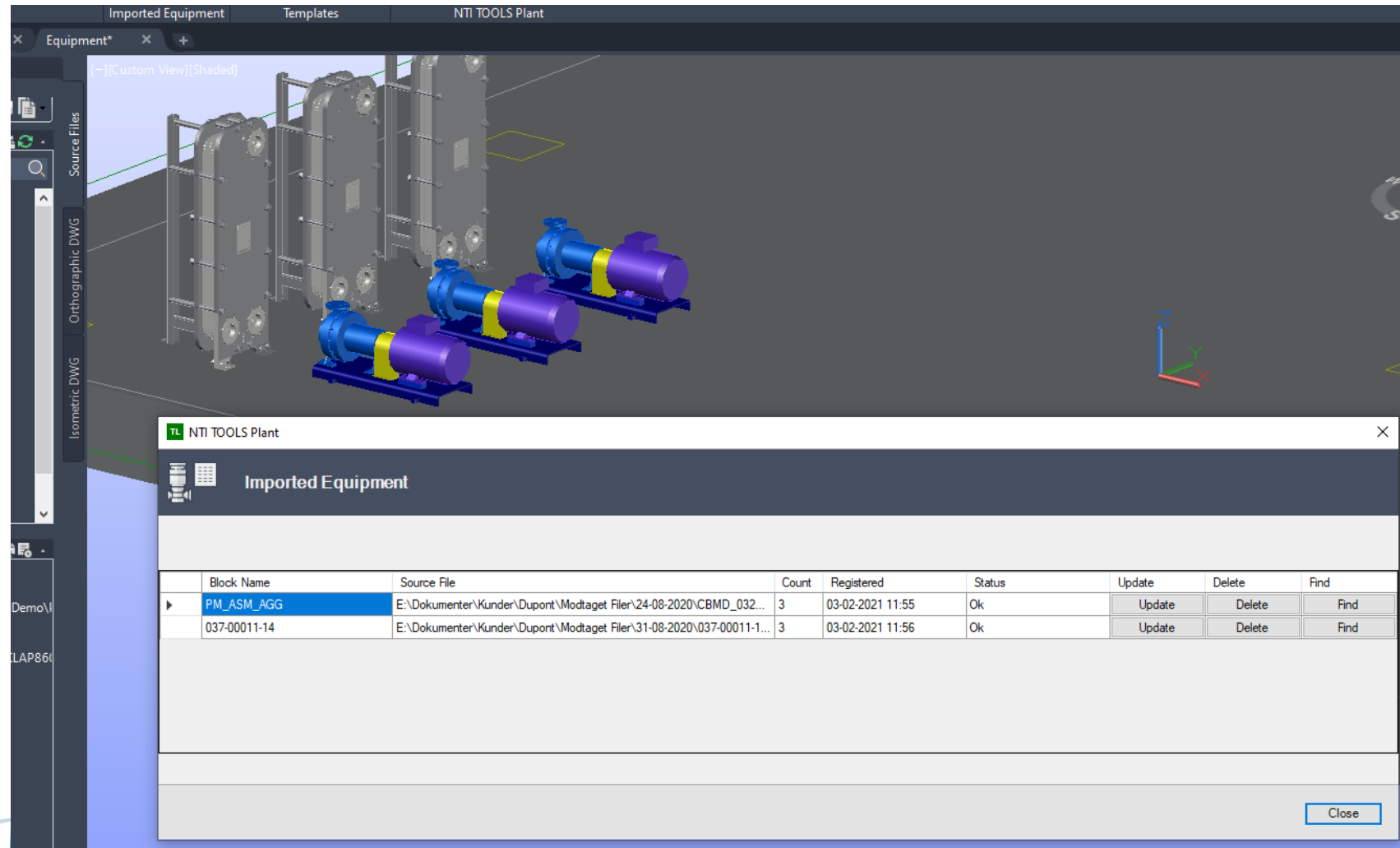
NTI TOOLS for AutoCAD Plant 3D

Imported Equipment

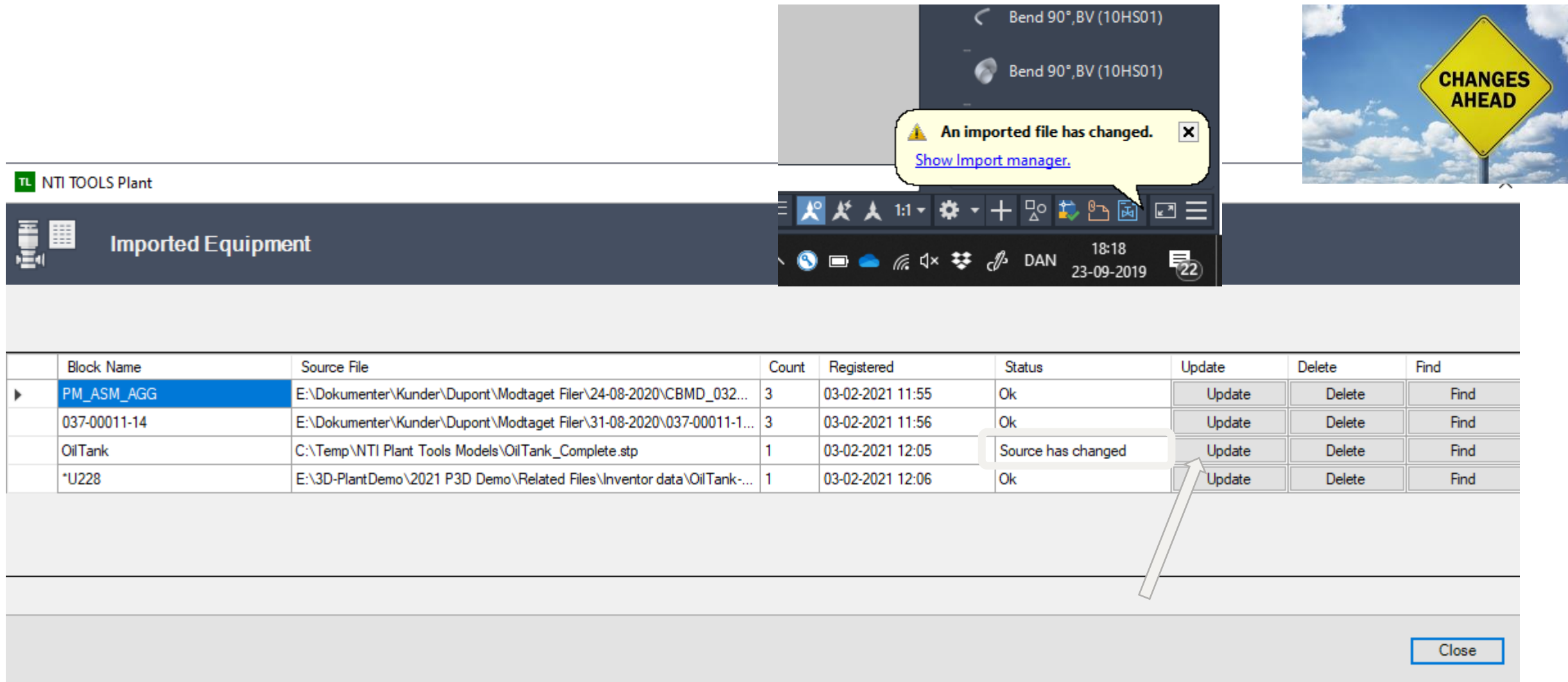
- Registrering af importerede solid modeller i hver Plant 3D model file
 - Supporterede formater er: ADSK, IPT, STP, SLDPR
- Importerede modeller registreres med unik id i DWG filen (filename + timestamp)
- Placering (move + rotate) af de enkelte modeller i layoutet registreres i DWG filen
- Metadata på modellen registreres
- Metadata på tilslutninger (Nozzel data) registreres
- Notifikation til brugerne hvis "original" filen bliver overskrevet eller fjernet
- Mulighed for at få opdateret geometrien på de importerede / indsatte modeller
- Mulighed for at vælge ny kildefil for en indsat model.



NTI TOOLS for AutoCAD Plant 3D



NTI TOOLS for AutoCAD Plant 3D

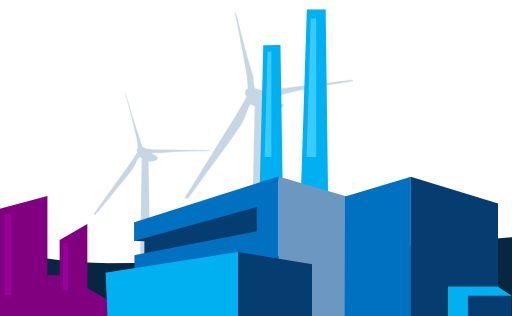
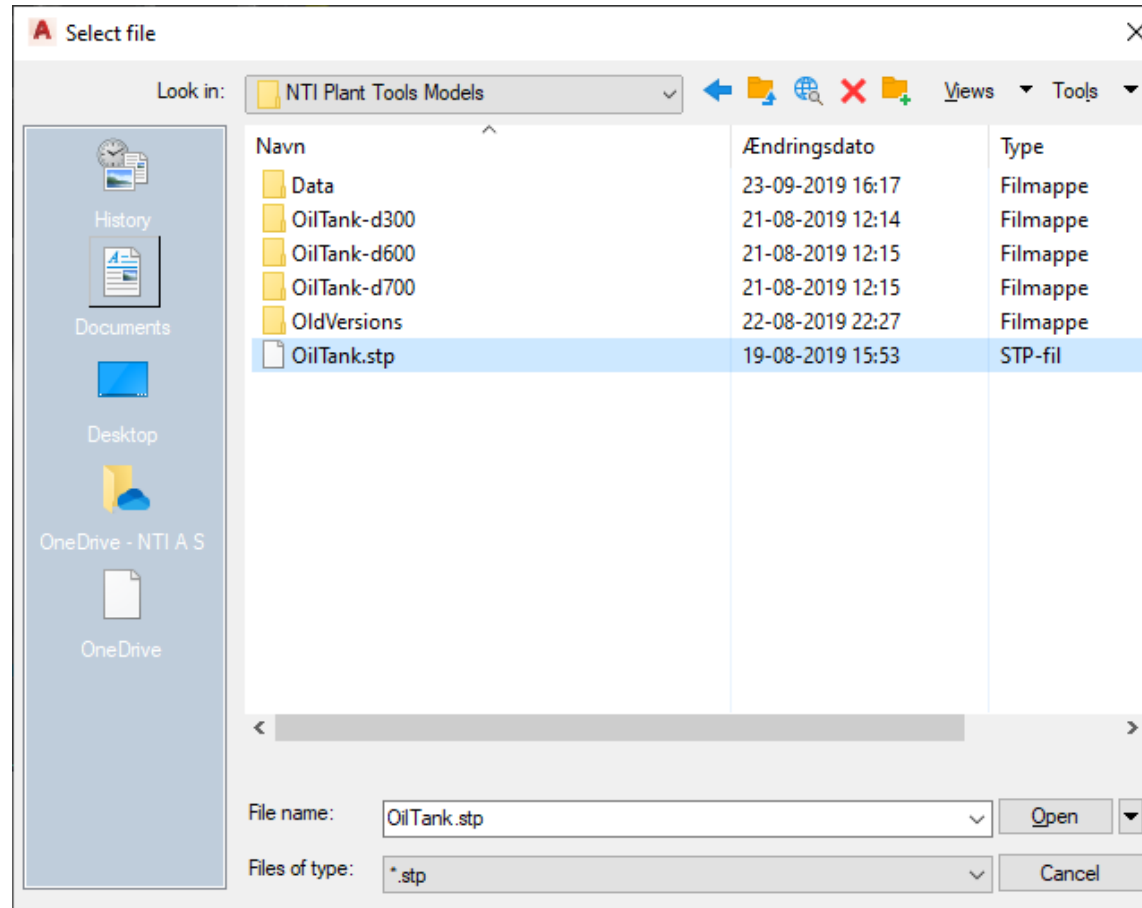


The screenshot displays the NTI TOOLS Plant software interface. At the top, a warning message states: "An imported file has changed. Show Import manager." Below this, the "Imported Equipment" table lists the following data:

Block Name	Source File	Count	Registered	Status	Update	Delete	Find
PM_ASM_AGG	E:\Dokumente\Kunder\Dupont\Modtaget Filer\24-08-2020\CBMD_032...	3	03-02-2021 11:55	Ok	Update	Delete	Find
037-00011-14	E:\Dokumente\Kunder\Dupont\Modtaget Filer\31-08-2020\037-00011-1...	3	03-02-2021 11:56	Ok	Update	Delete	Find
OilTank	C:\Temp\NTI Plant Tools Models\OilTank_Complete.stp	1	03-02-2021 12:05	Source has changed	Update	Delete	Find
*U228	E:\3D-PlantDemo\2021 P3D Demo\Related Files\Inventor data\OilTank-...	1	03-02-2021 12:06	Ok	Update	Delete	Find

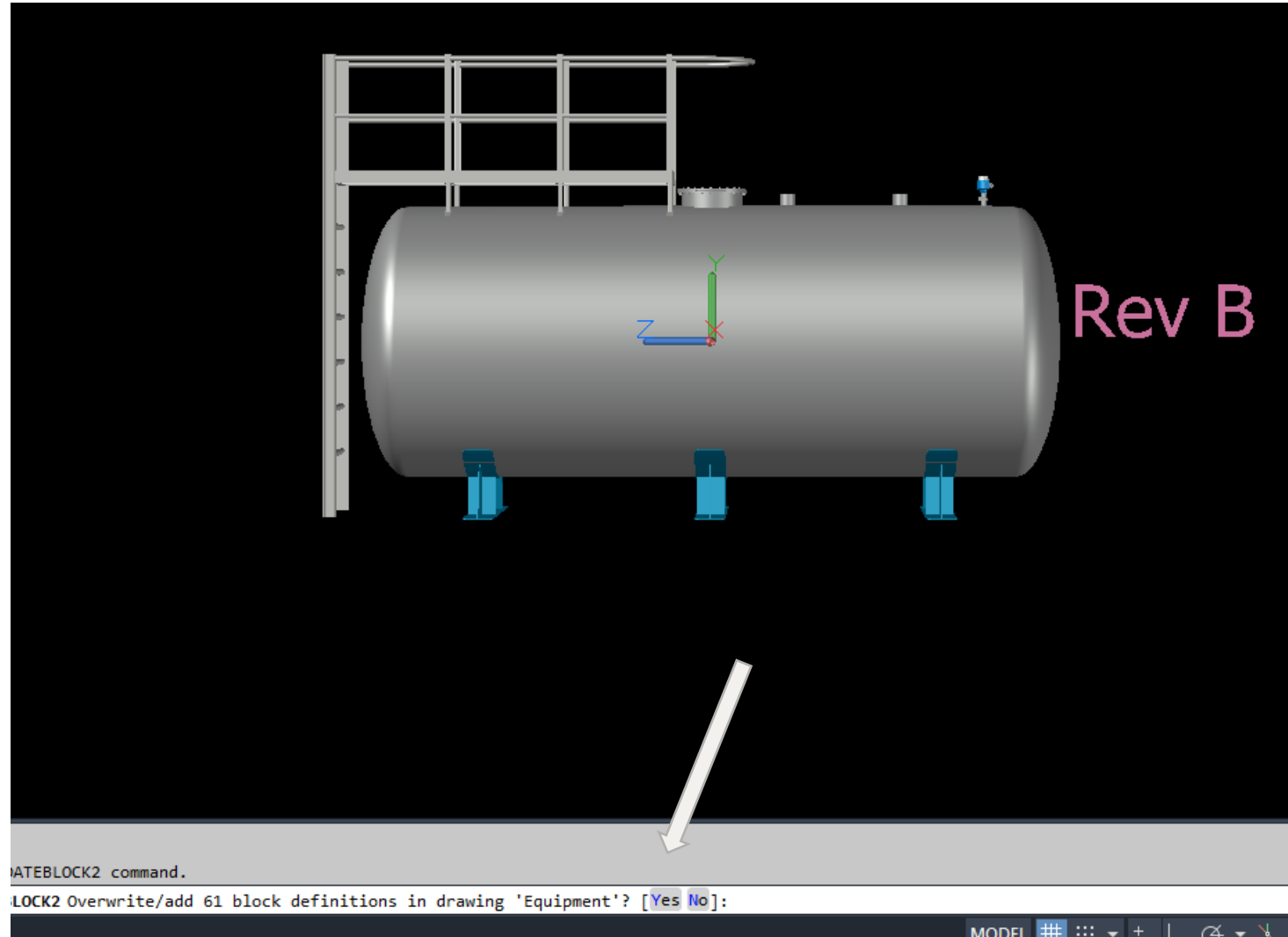
A yellow diamond-shaped sign with the text "CHANGES AHEAD" is visible in the top right corner. The interface also shows a toolbar with various icons and a status bar at the bottom with a "Close" button.

NTI TOOLS for AutoCAD Plant 3D

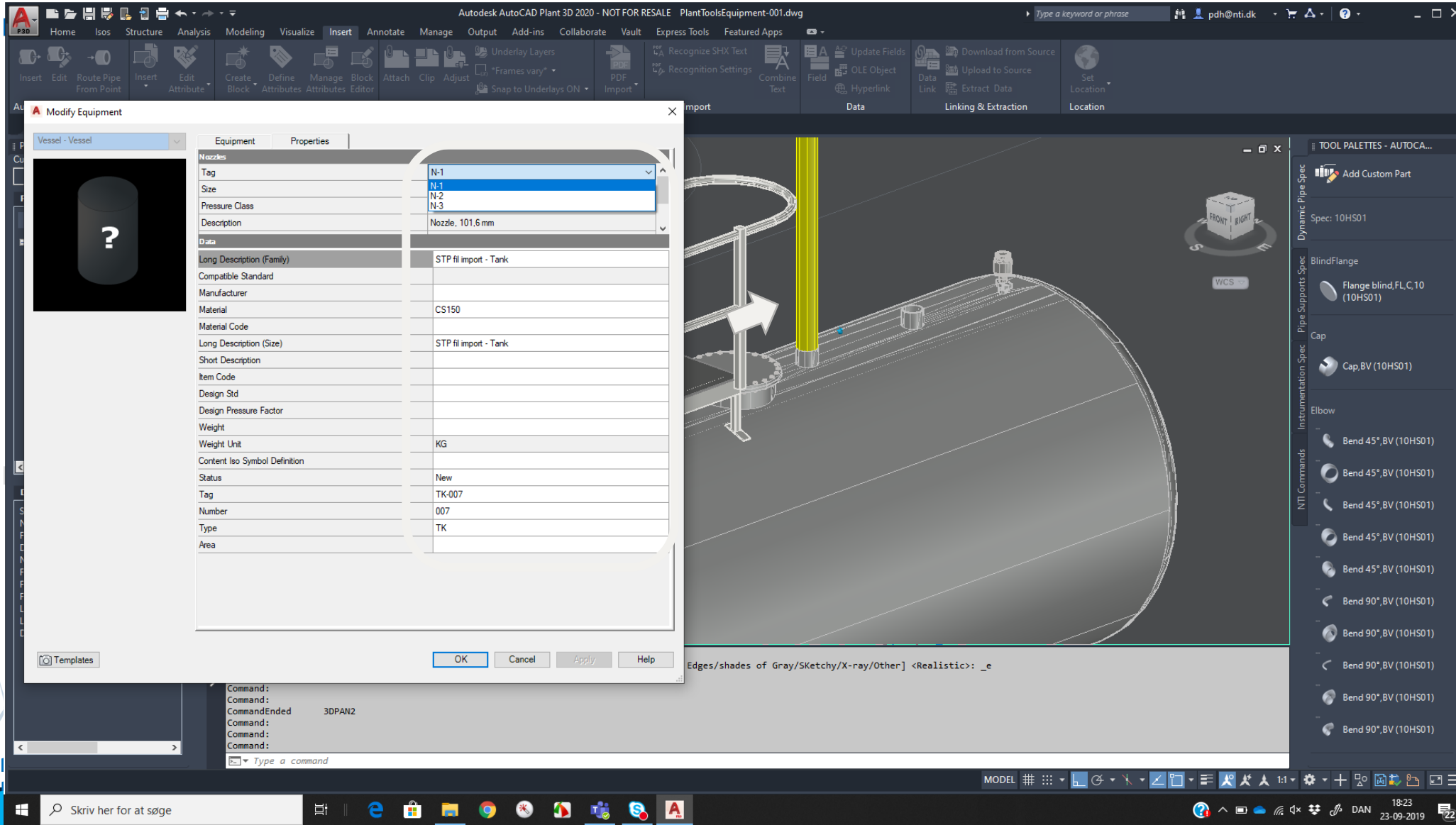


NTI TOOLS for AutoCAD Plant 3D

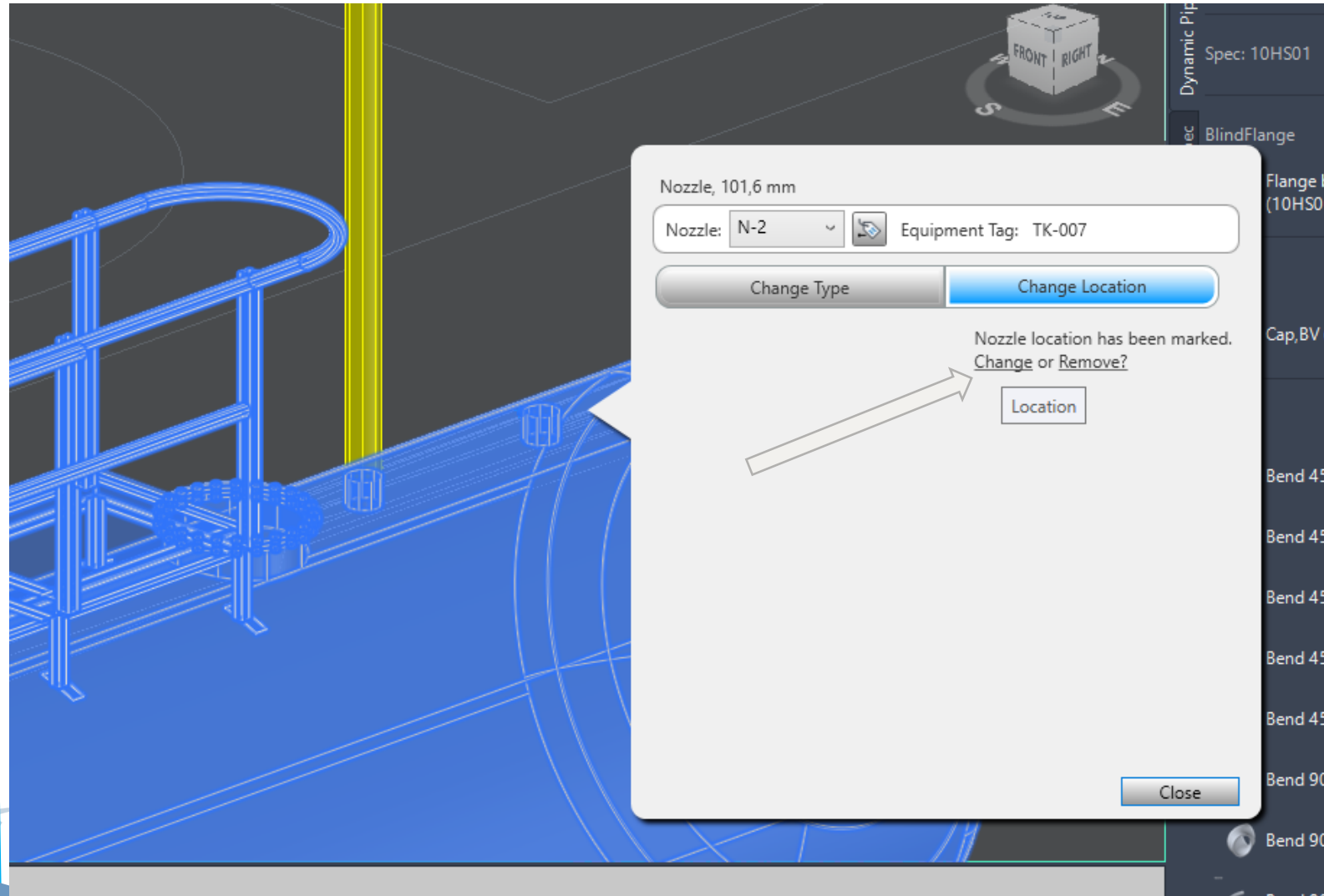
- Preview before updating the models



NTI TOOLS for AutoCAD Plant 3D

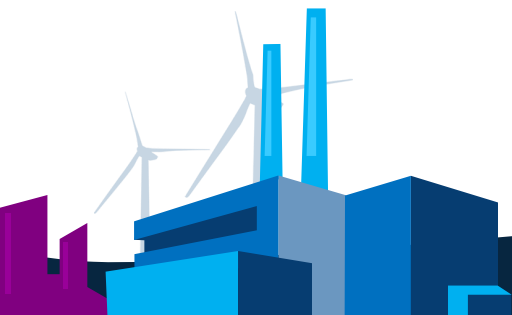
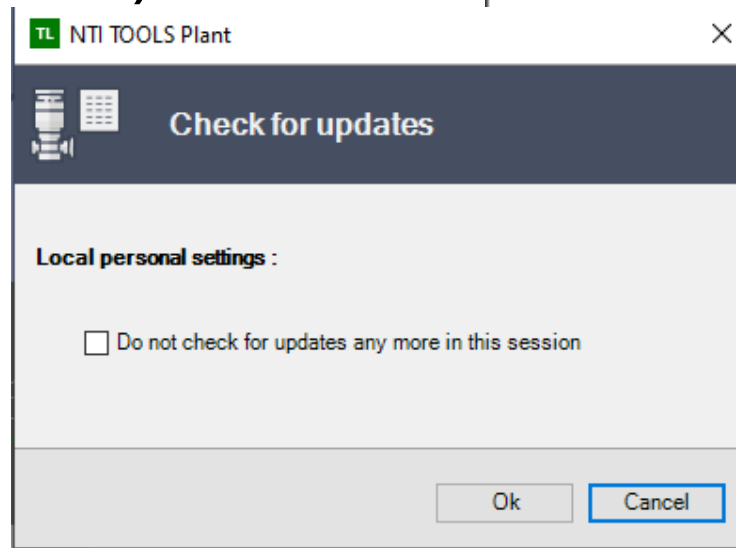
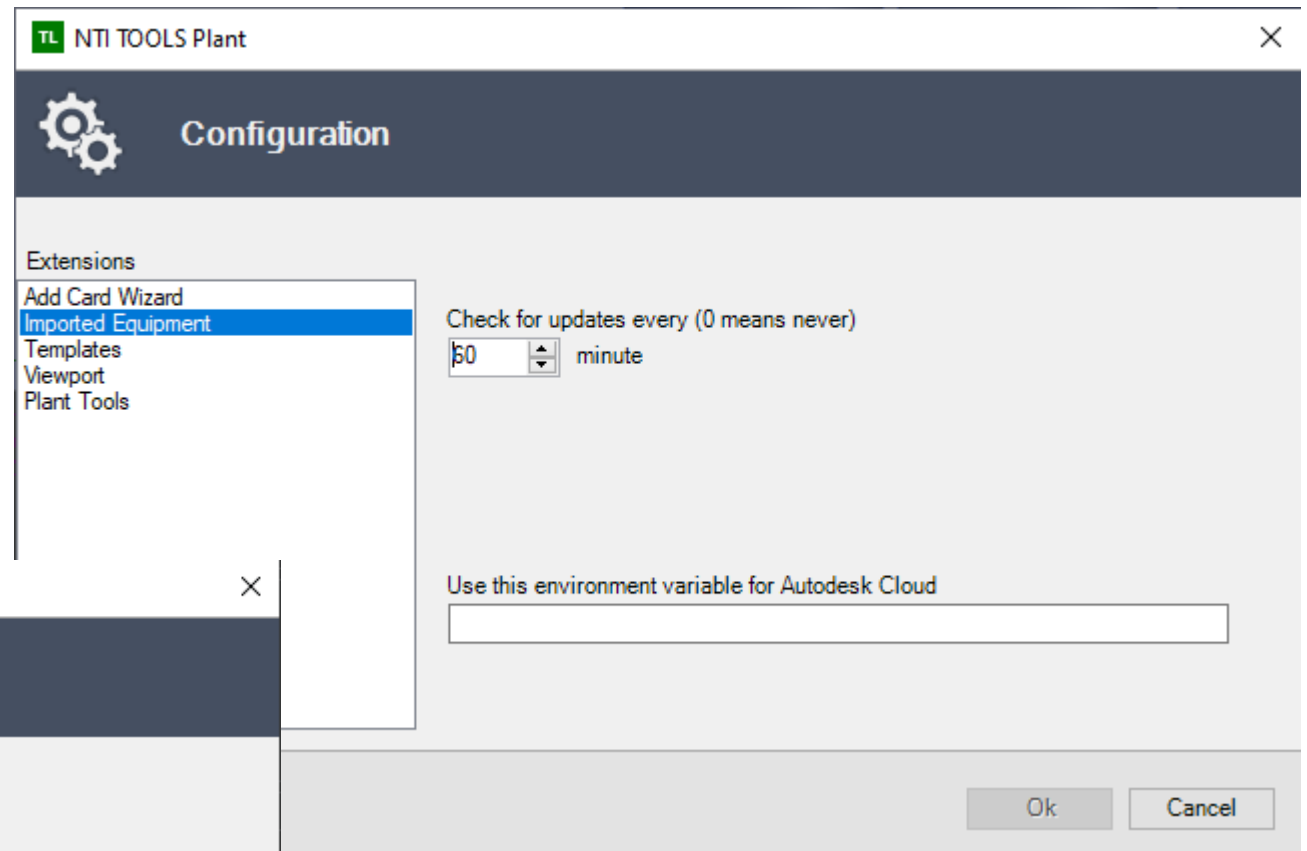


NTI TOOLS for AutoCAD Plant 3D



NTI TOOLS for AutoCAD Plant 3D

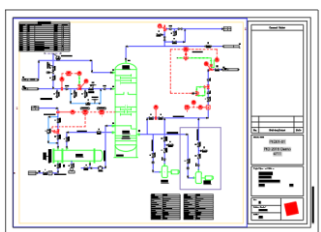
- Easy to use - minimum setup
 - Setting how often to check
 - Support for BIM 360 (Autodesk Cloud)



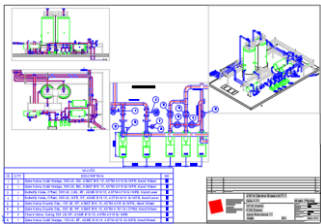
Leverandør til Plant Designet

Plant Design Workflow

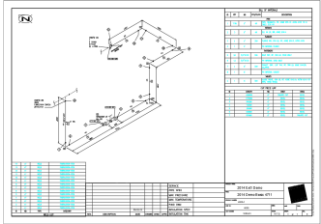
P&I Diagrammer



Layout & Arrangements tegninger



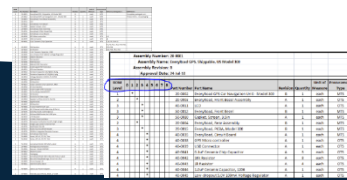
Rør Isometri tegninger



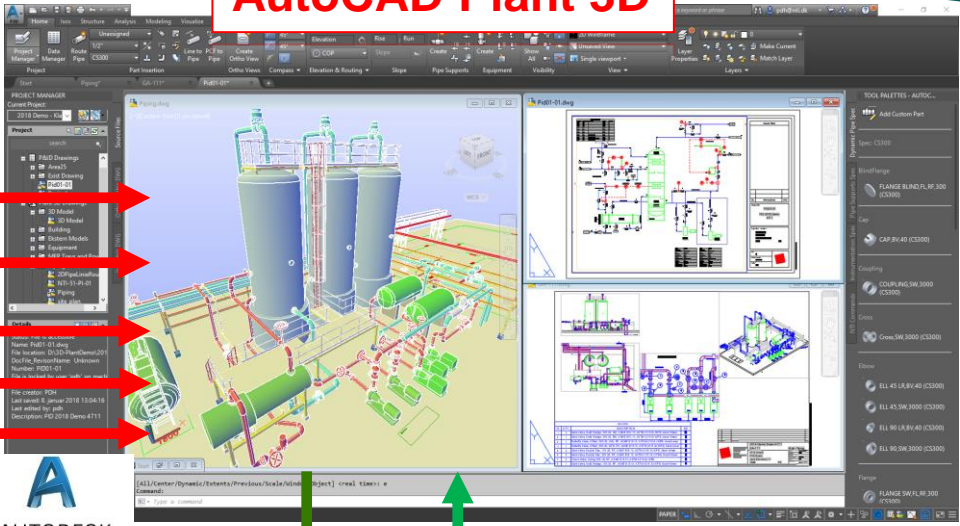
Visualisering /Walk through



Rapporter & Lister

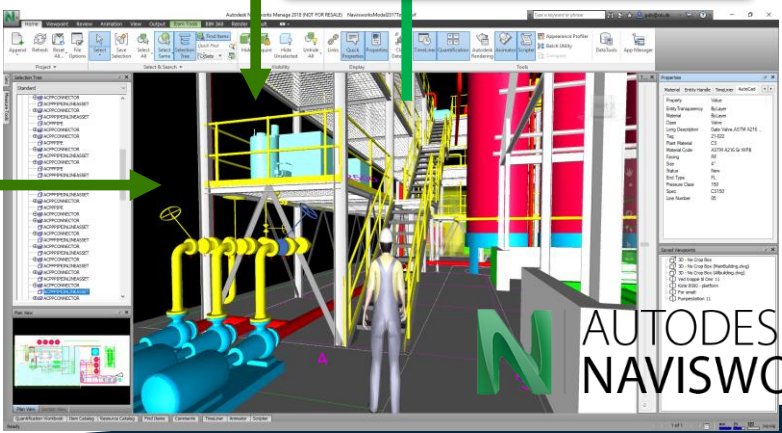


AutoCAD Plant 3D



AUTODESK
AUTOCAD PLANT 3D

Coordinations model



AUTODESK
NAVISWORKS

OUTPUT

AUTODESK®
RECAP

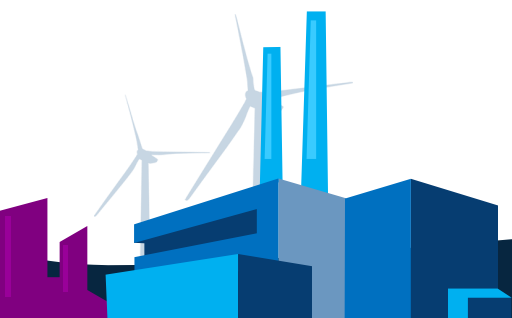
AUTODESK®
INVENTOR®

AUTODESK
REVIT

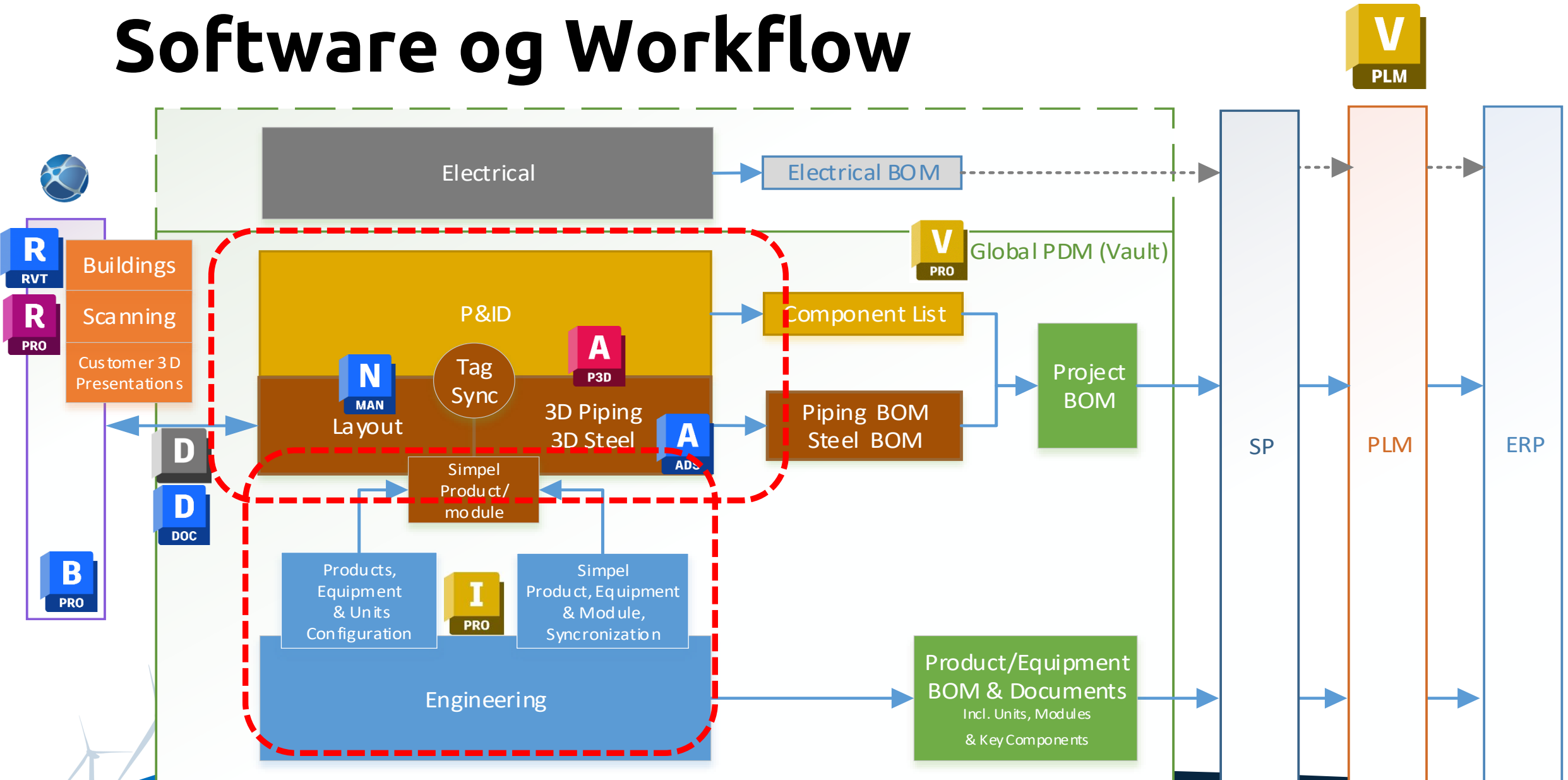
ANYCAD

AUTODESK®
ADVANCE STEEL

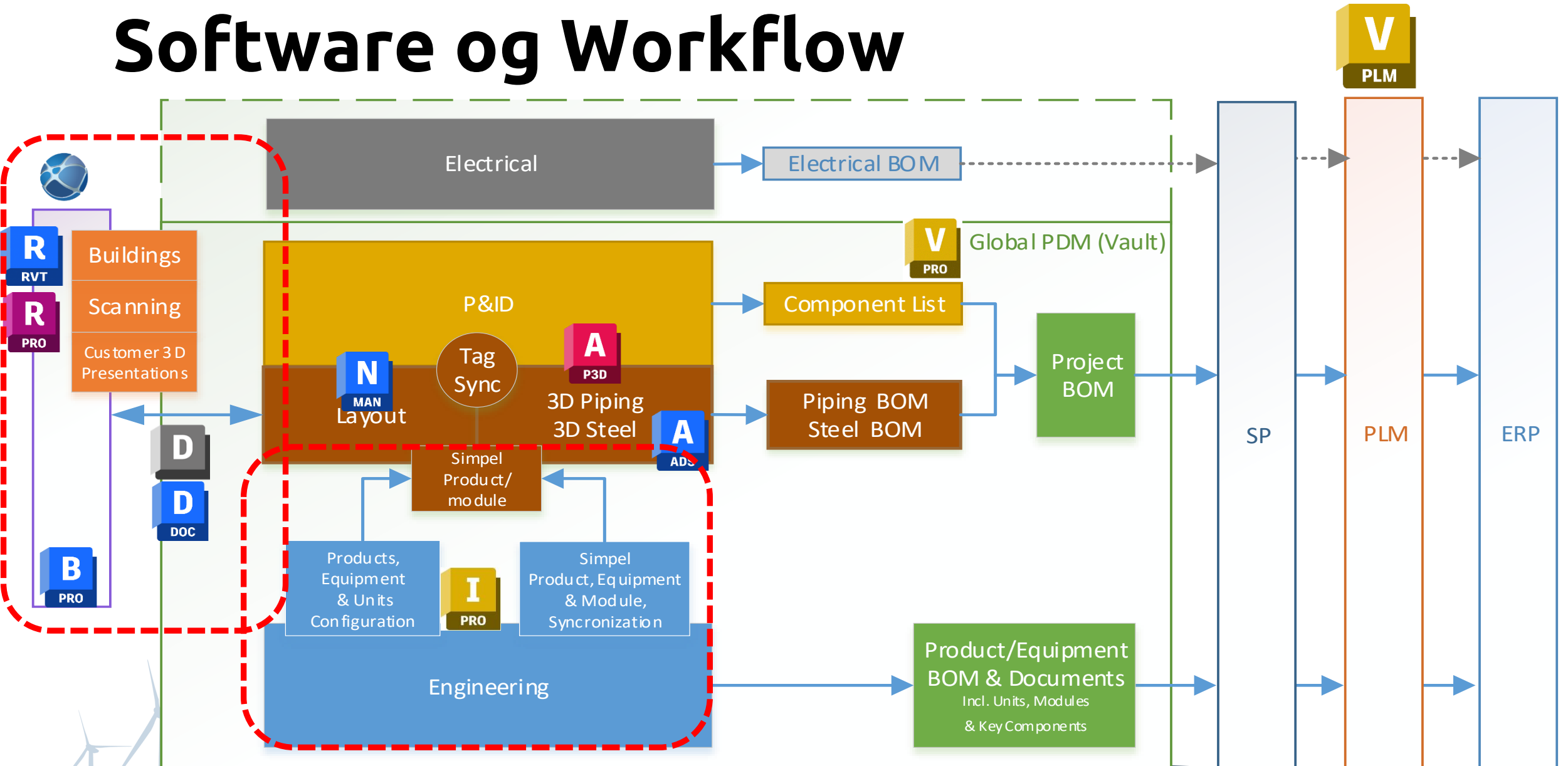
Simplificerings behov





Software og Workflow

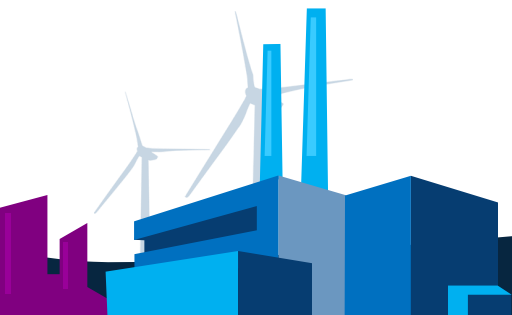


Software og Workflow



Revit & AutoCAD Plant 3D

- Autodesk Revit
 - Forberedelse af Revit-model til brug i Plant 3D (export) 
 - Reference til Plant 3D modeller i Revit (Link)
- AutoCAD Plant 3D
 - Forberedelse af Plant 3D modeller til brug i Revit (export) 
 - Reference til Revit-model i Plant 3D (Xref)



Revit model i AutoCAD Plant 3D



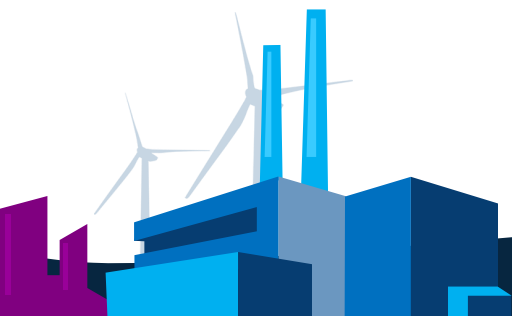
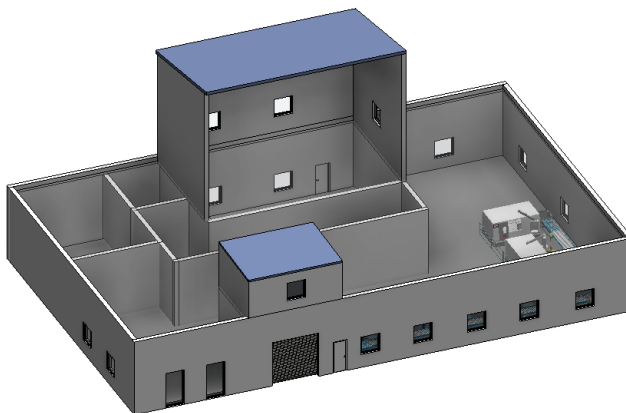
- Design fasen.
 - Koordinering er vigtigt, mange opdateringer.
Her vil en Navisworks Coordination model (NWC) være optimalt.



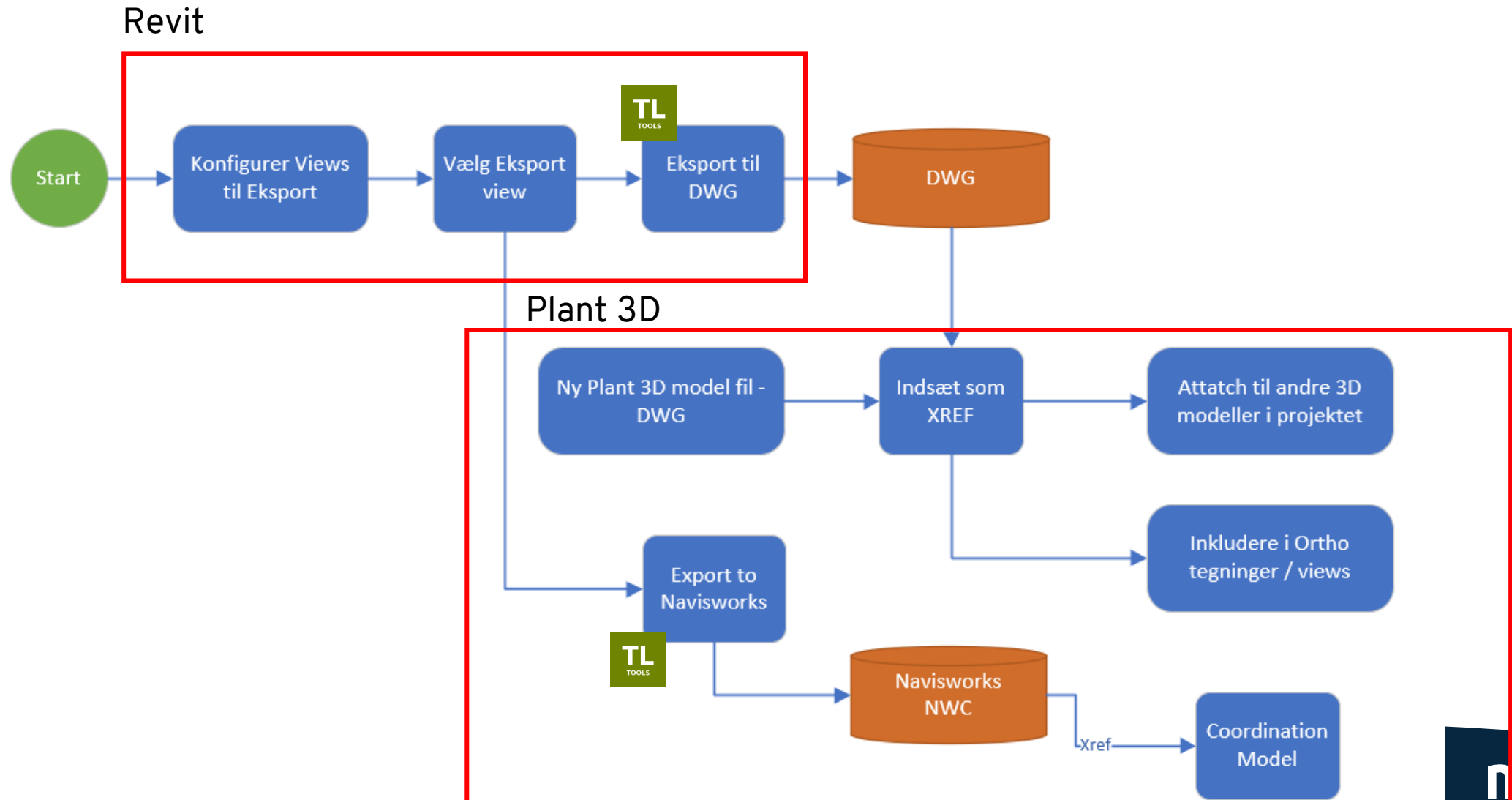
- Konstruktions / dokumentations fasen.
 - Exporterede DWG 3D modeller som xreffes ind i P3D
 - Exporterede DWG / PDF 2D layouts som xreffes ind i P3D



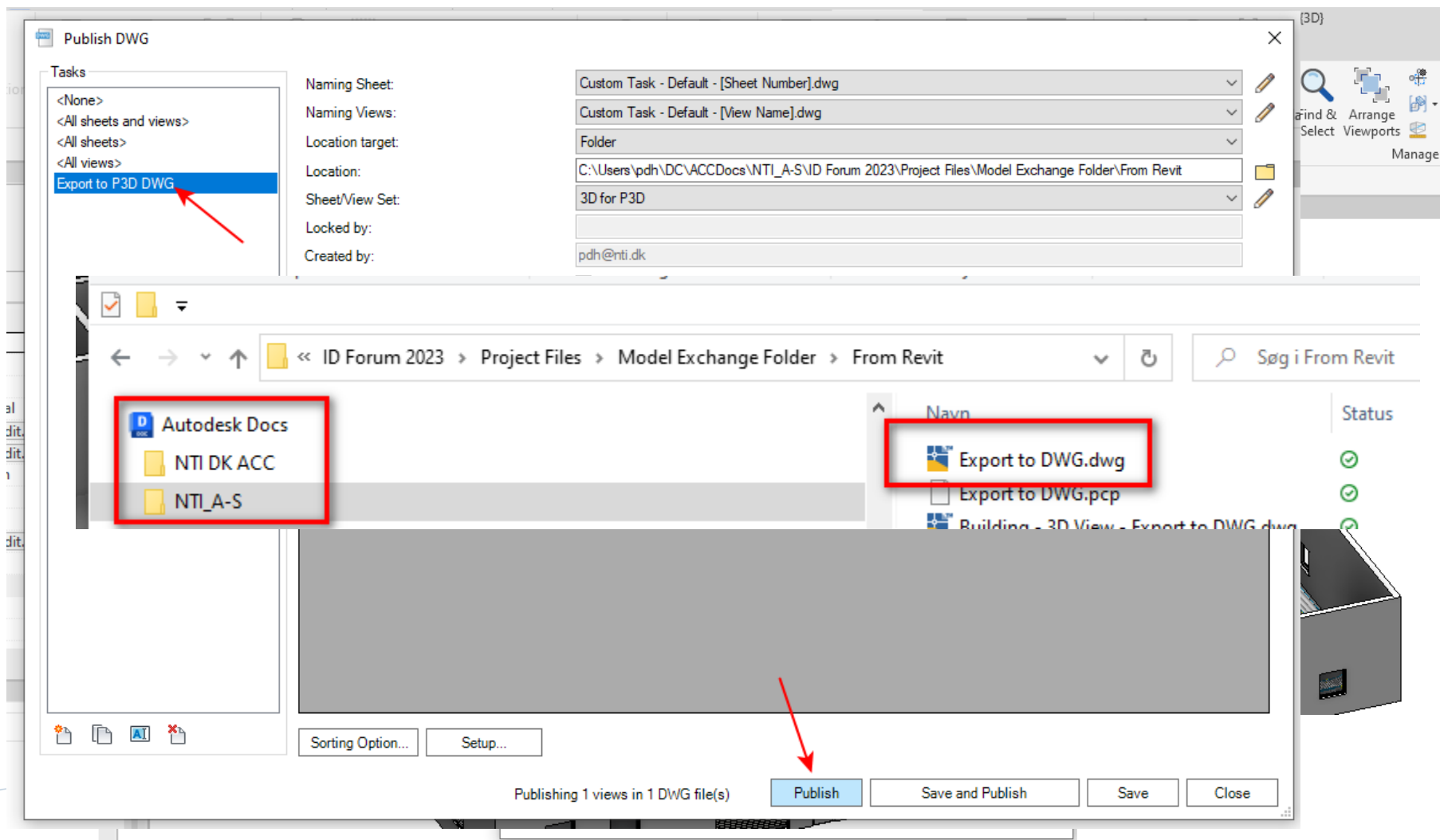
*Revit modellen skal simplificeres / beskæres så den tilpasses til det område der er nødvendigt i Plant 3D modellen.
Herved øges performance betragteligt i Plant 3D – både i 3D arbejdet men også ved håndtering af Ortho tegninger / views*



Workflow overblik



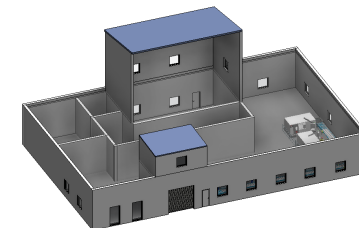
Revit model i AutoCAD Plant 3D



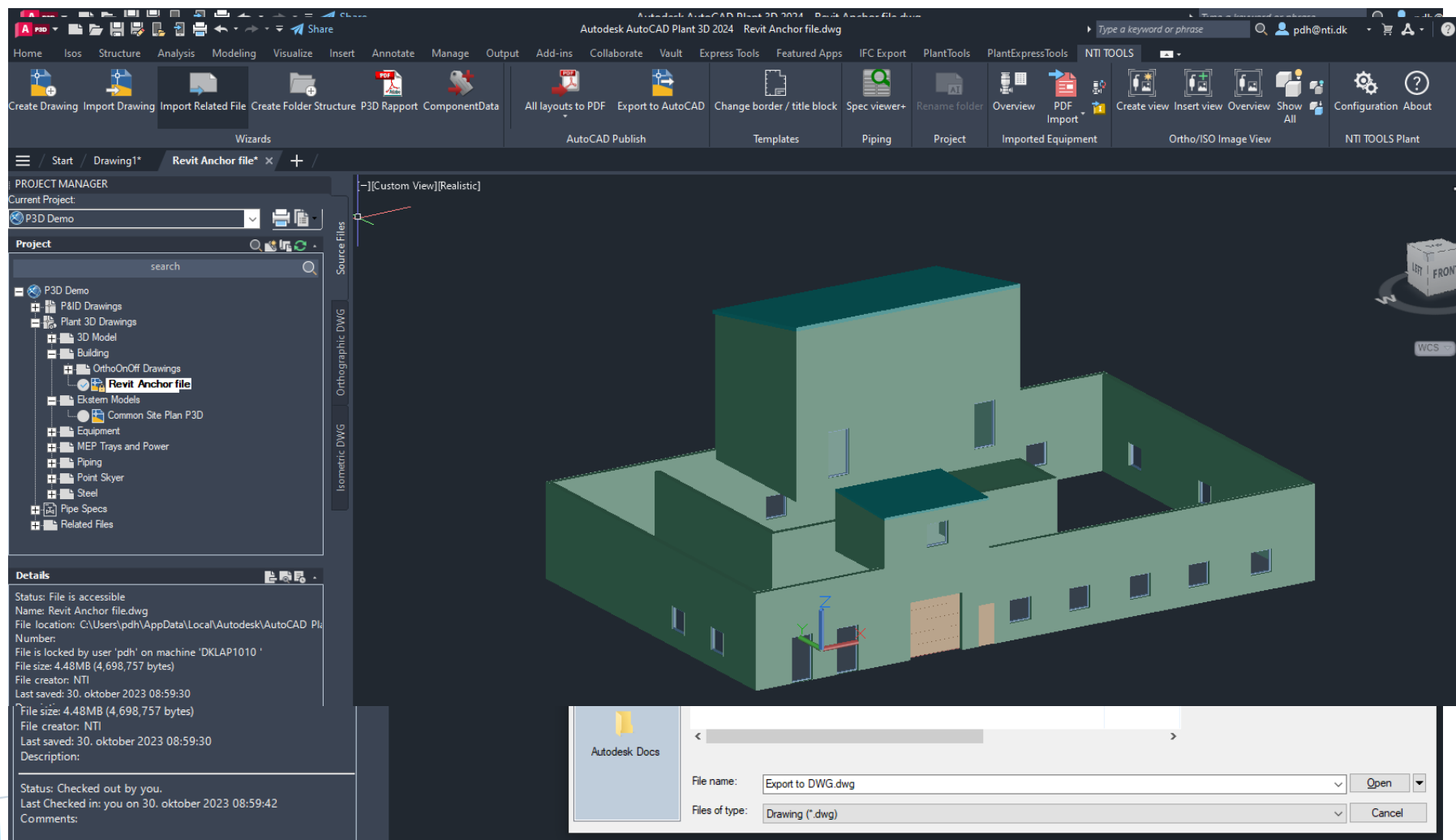
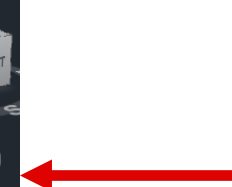
Revit model i AutoCAD Plant 3D



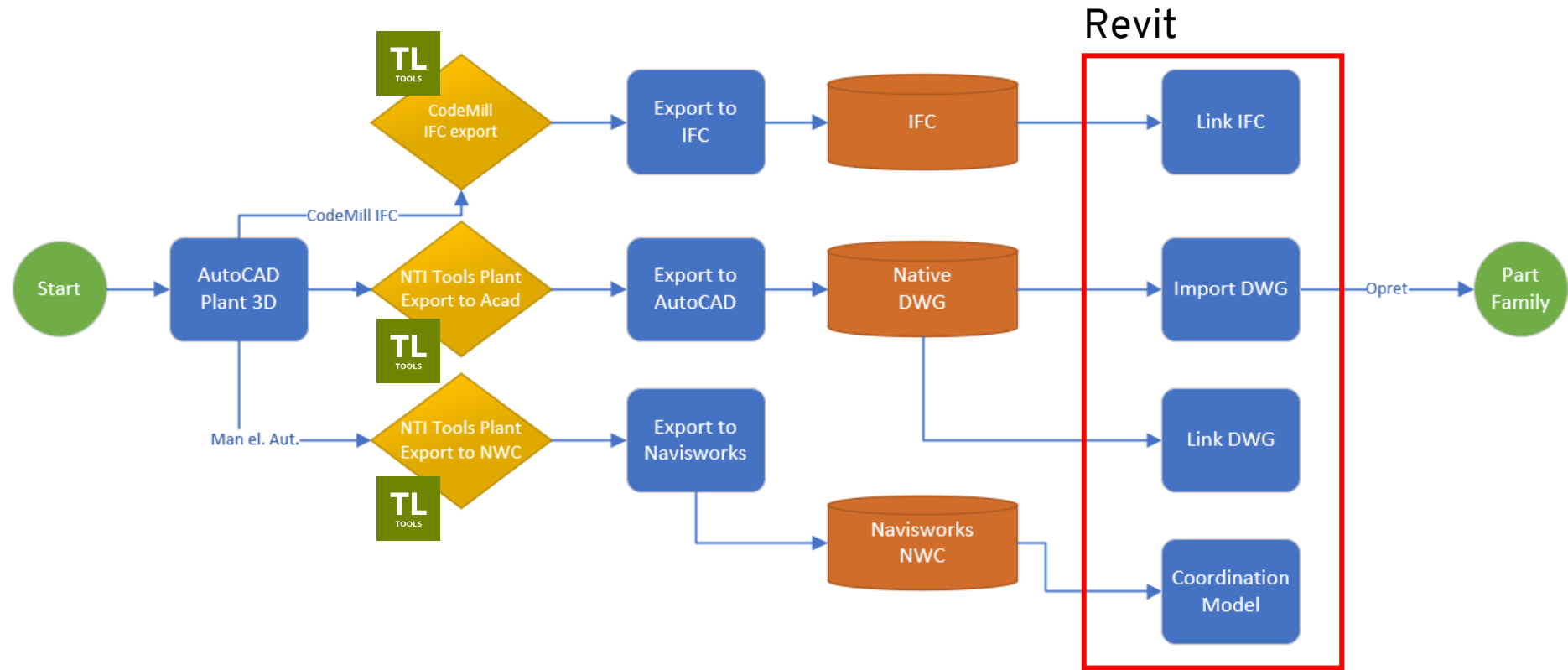
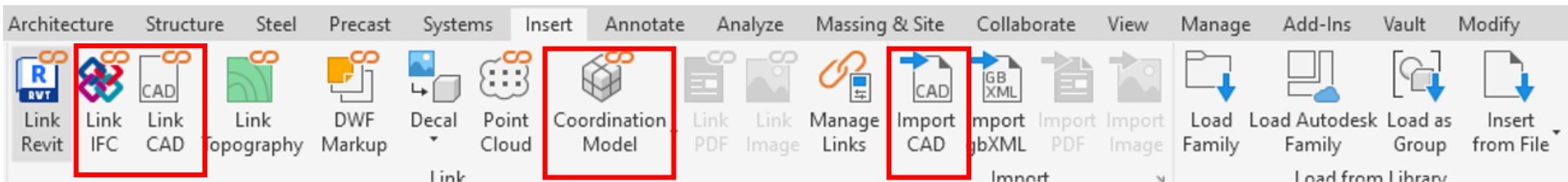
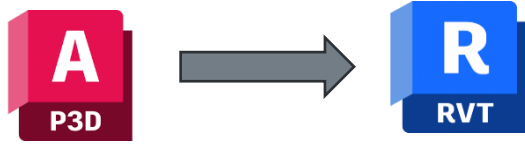
Revit Model



Reference



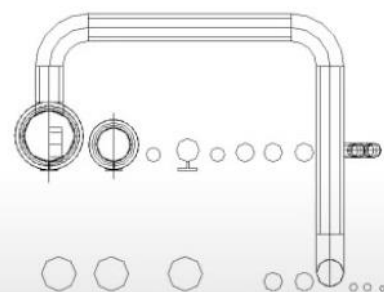
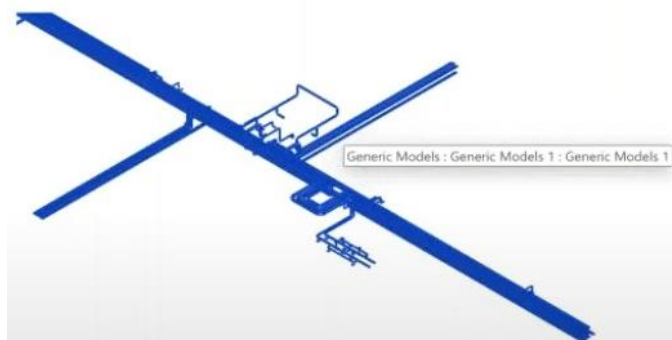
Workflow overview



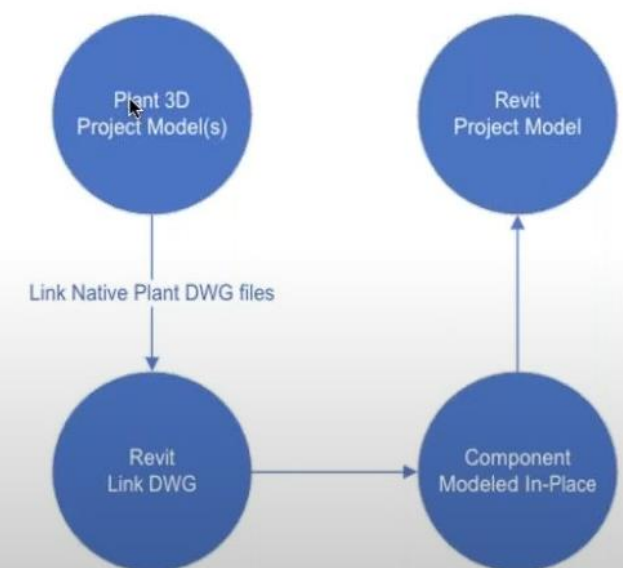


AutoCAD Plant 3D model ind i Revit

- Den "bedste" metode afhænger igen af behovet.
 - Design fasen:
Eksportere Plant 3D modellen til AutoCAD DWG (solids)
 - Link Plant 3D models (direkte)

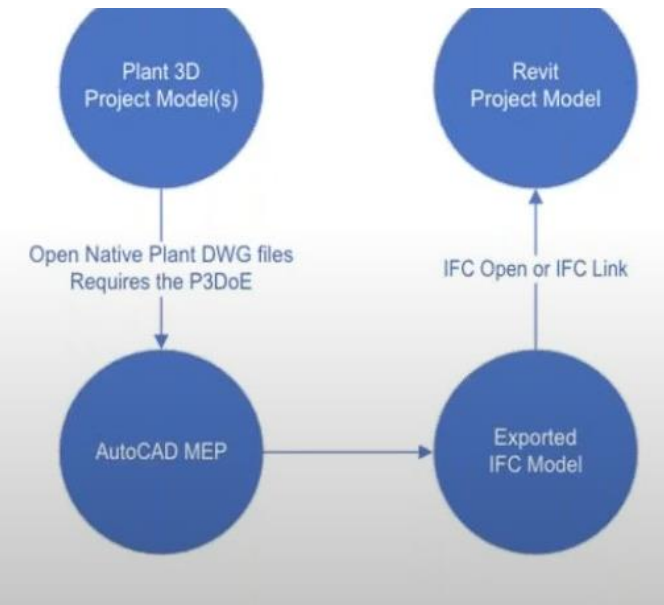
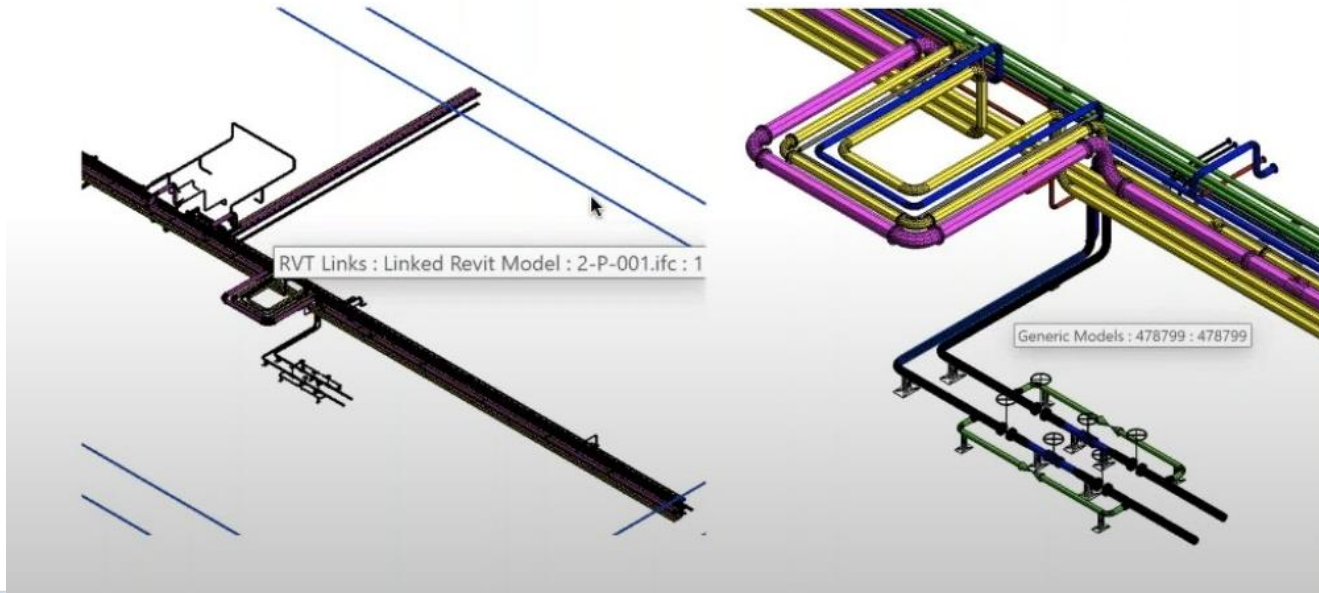
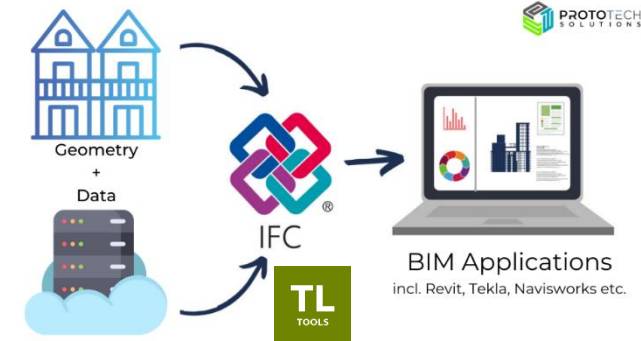


Level 2
10' - 0"

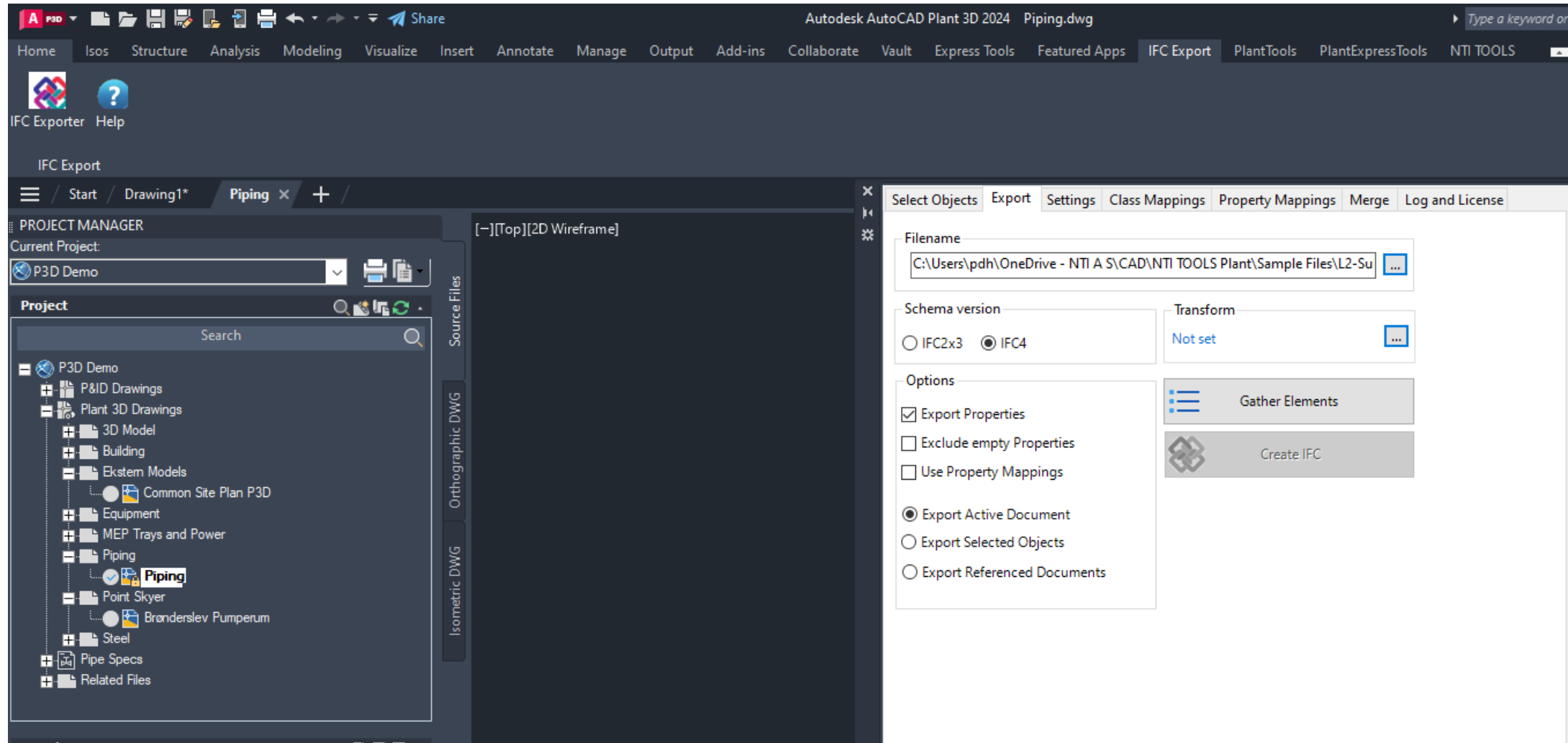


AutoCAD Plant 3D model ind i Revit

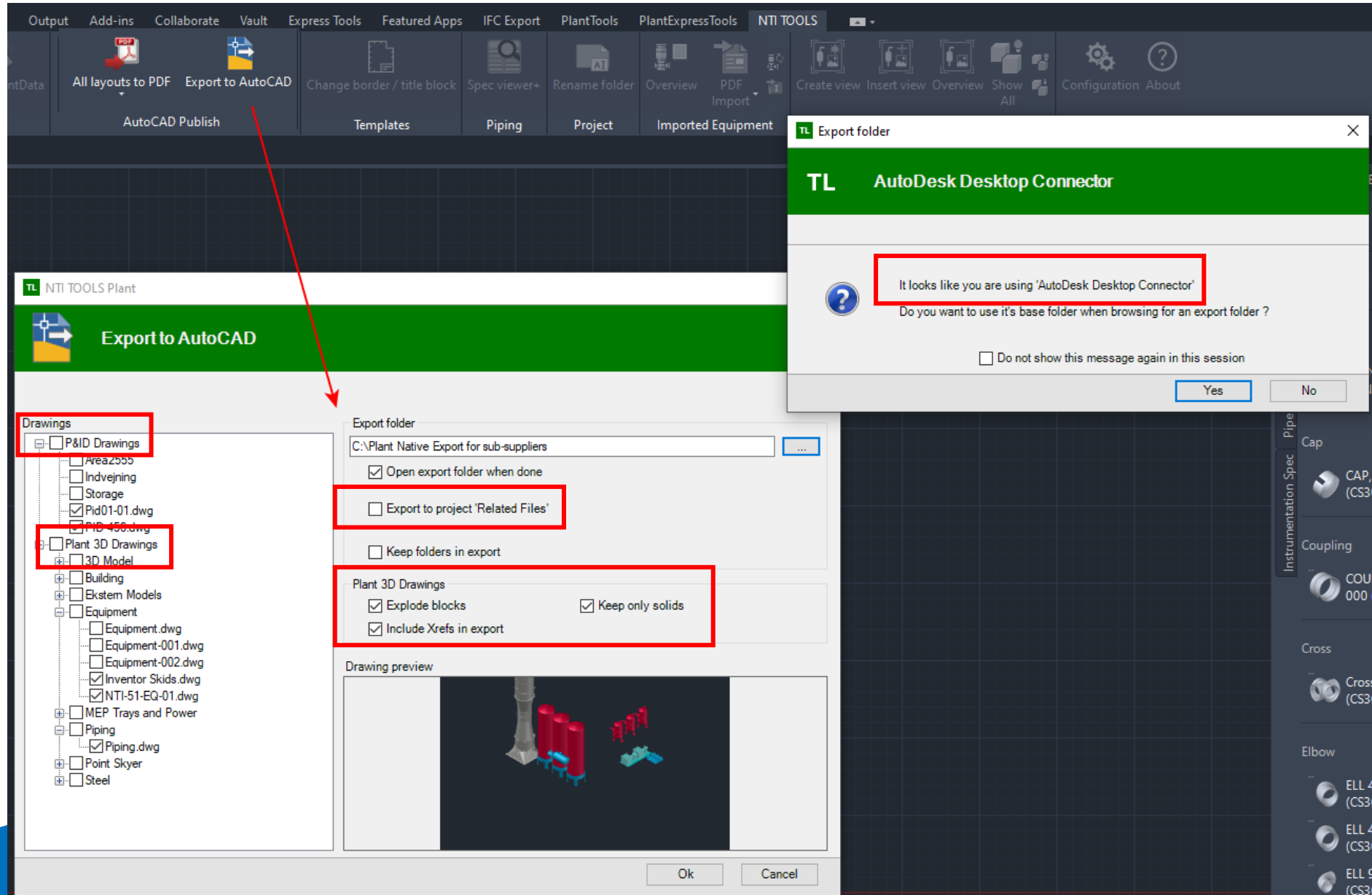
- Metode afhænger igen af behovet – hvis der er behov for geometri & data.
 - Eksporter til IFC format for herefter at åbne eller linke til IFC filen.



IFC Export - CodeMill

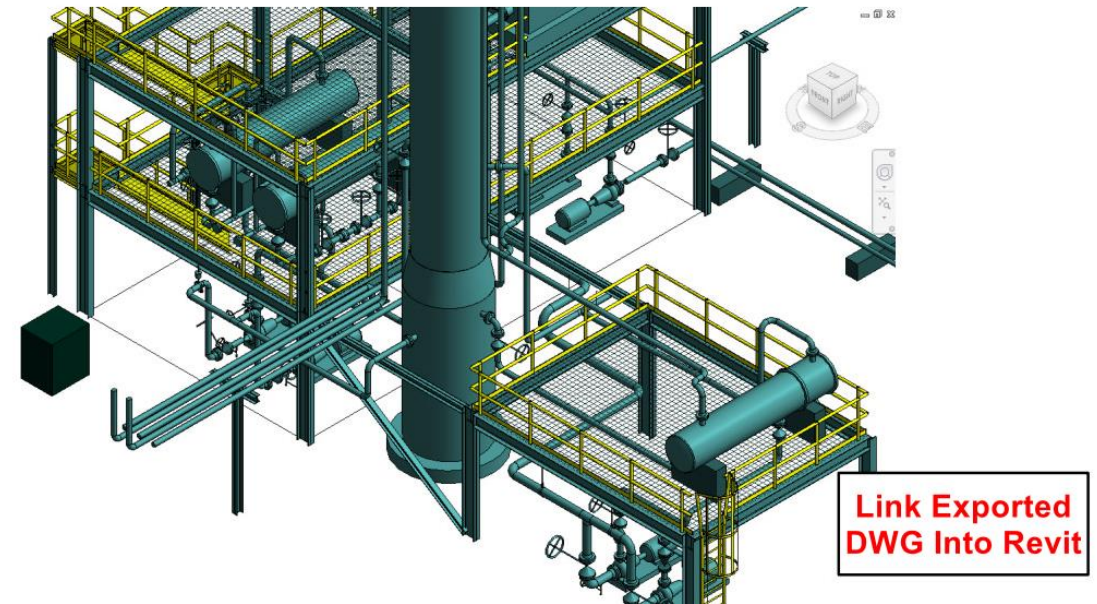
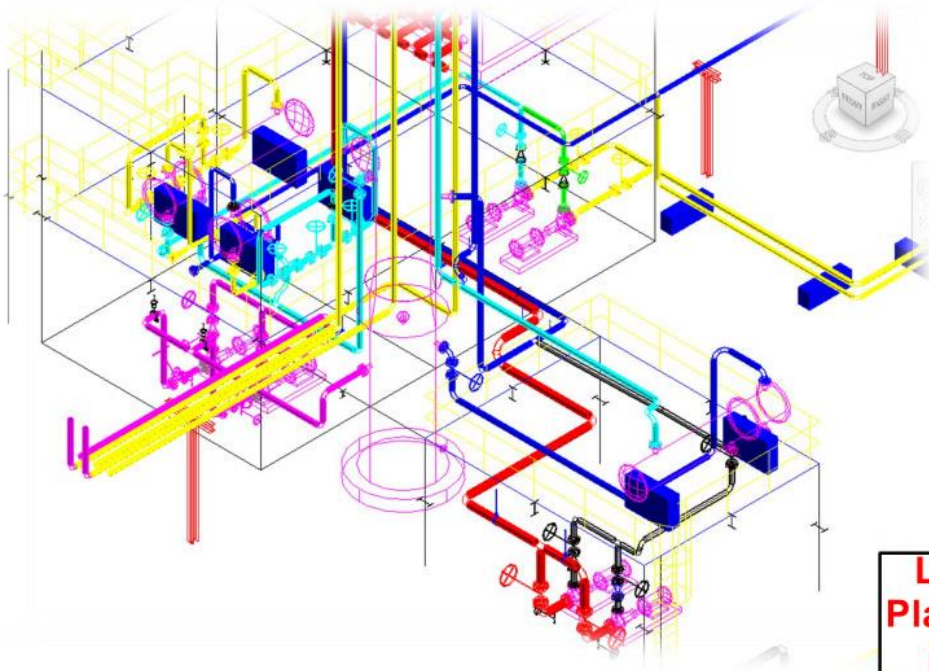


Export til AutoCAD



Plant 3D til Revit

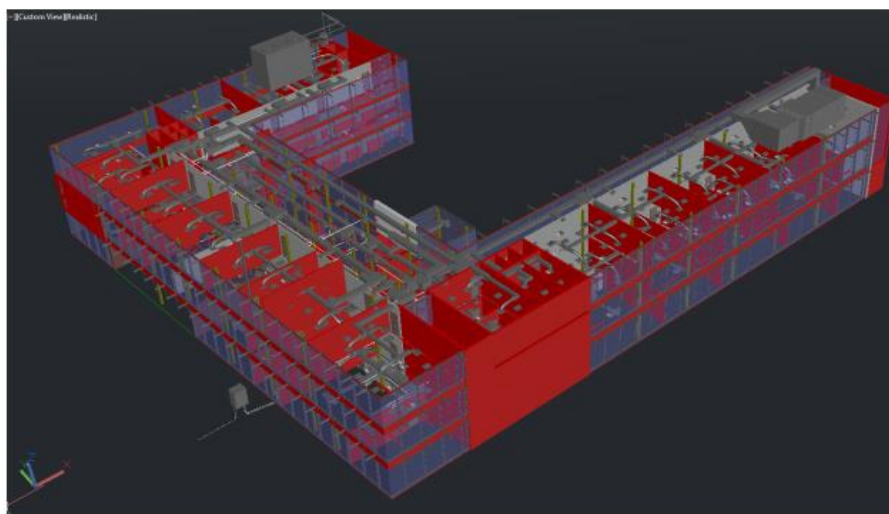
- Native Plant 3D model filer kontra Export to AutoCAD (solids)



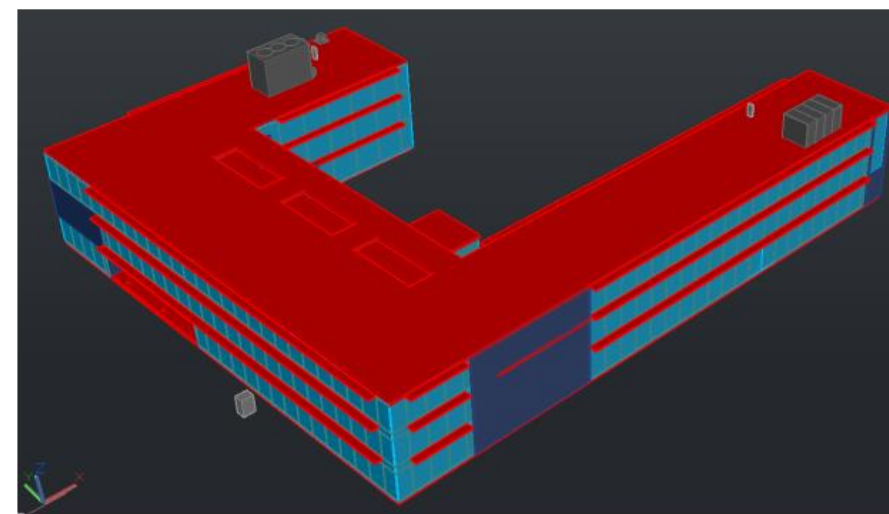


Plant 3D til Revit

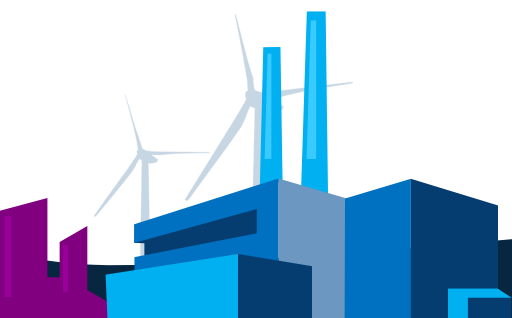
- Eksportere kun objekter som er nødvendige for Plant 3D



Full Revit Model Export
12.6 MB

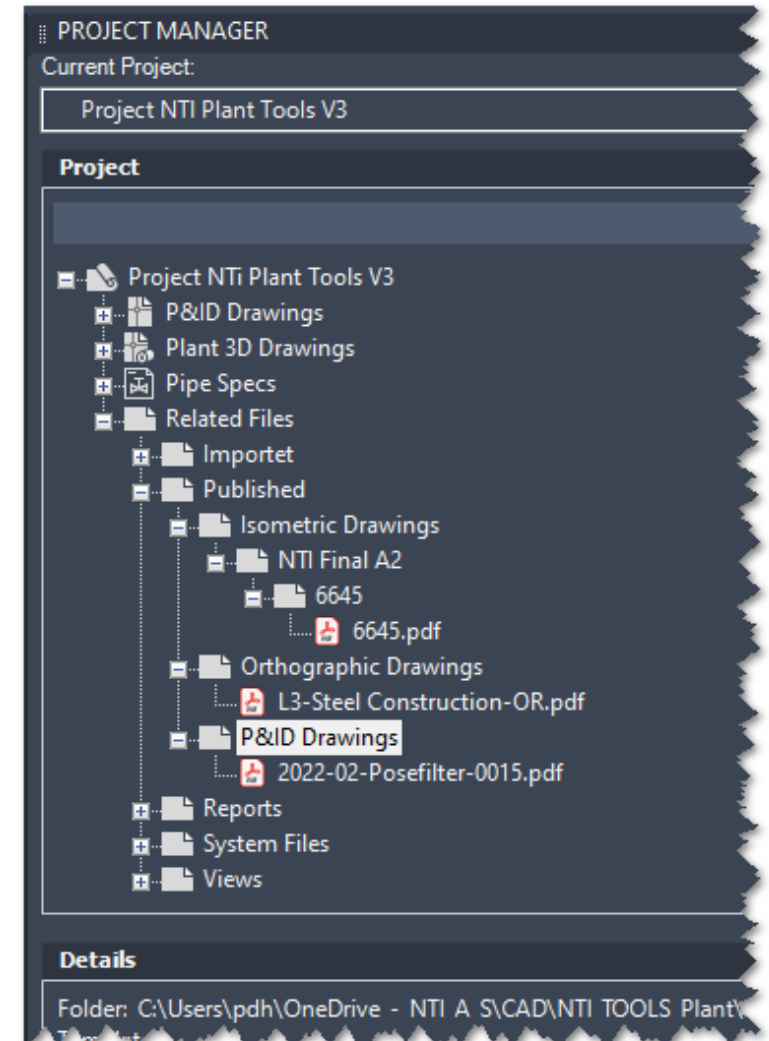


Simplified Revit Model Export
3.82 MB



NTI TOOLS PLANT – Export to PDF

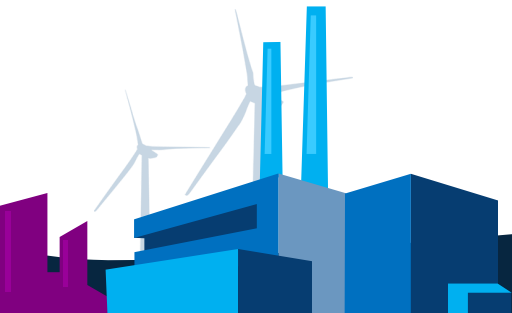
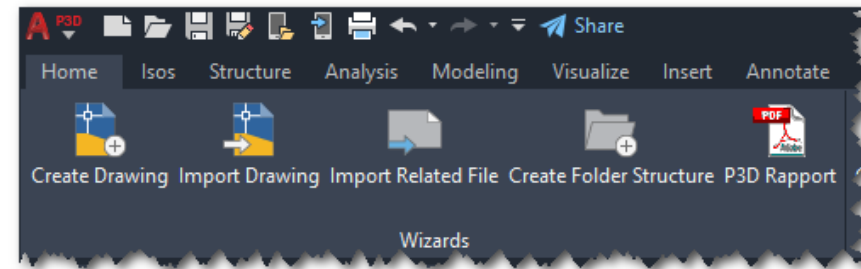
- **AutoCAD Publish - PDF**
 - Typisk oprettes mange PDF-filer i et Plant-projekt.
 - Det skal være nemt og ligetil at skabe PDF filer PID-tegninger, Ortotegninger og ISOmetriske tegninger.
 - PDF filer – 1 klik
 - PDF filer gemmes i projektet, under Relaterede filer.
 - I Vault- og ACC/BIM-projekter bliver PDF filerne hermed "automatisk" uploades til Vault/ACC/BIM-løsningen.



NTI DOCUMENT WIZARD

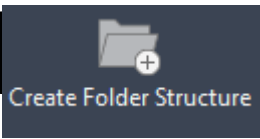
Kontrolleret oprettelse og navngivning af filer og mapper

- Opret filer og mapper i henhold til en række relevante spørgsmål
- Benyt unikt nummerskema eller brug eksterne numre / Vault Number-scheme
- Importer filer til projektet
- Opret en mappestruktur, løbende – eller en fast, foruddefineret mappestruktur
- Udfyld tegnings properties
- Opretter P&ID- og Plant 3D-rapporter og gemmer dem i projektet



NTI TOOLS DOCUMENT WIZARD

Create Folder structure



Autodesk AutoCAD Plant 3D 2022 GA1-T1.dwg

Home Isos Structure Analysis Modeling Visualize Insert Annotate Manage Output Add-ins Collaborate Vault Featured Apps Express Tools **Ortho View** Layout PlantTools PlantExpressTools **NTI TOOLS**

Create Drawing Import Drawing Import Related File **Create Folder Structure** Plot first layout with a single title border Change border / title block Rename folder Overview Create view Insert view Overview Show All Configuration About

Wizards AutoCAD Publish Templates Project Imported Equipment Ortho/ISO Image View NTI TOOLS Plant

Folder Structure - PID

Folder Structure - Ortho

Folder Structure - P3D

Folder Structure - Related Files

Rapports, renamed to project No.

System Files / Templates

Support for BIM 360 and Vault

PROJECT MANAGER
Current Project: Project Folder Structure Sample

Project

- Project Folder Structure Sample
 - P&ID Drawings
 - Bottling
 - Maltning
 - Post Processing
 - Pre Processing
 - Storage
 - Weighing
 - Plant 3D Drawings
 - Bottling
 - Maltning
 - Post Processing
 - Pre Processing
 - Storage
 - Weighing
 - Pipe Specs
 - Related Files
 - Documentation
 - Function description
 - Navisworks Files
 - Project description
 - Reports
 - P&ID Reports
 - Plant 3D Reports
 - 2022-02-Common Drawinglist.pdf
 - System Files
 - PID MasterData
 - PID_Components_Master.udl
 - PID_Components_Master.xlsx
 - ReportTemplates
 - 3D BOM.rcf
 - Common Drawinglist.rcf
 - PID Itemlist Rev2.rcf

Orthos

Project Folder Structure Sample

- Orthographic Drawings
 - Bottling
 - Maltning
 - Post Processing
 - Pre Processing
 - Storage
 - Weighing

Item Value

Select project type

Brewery

- ☐ Dairy
- ☒ Brewery
- ☐ Margarine factory
- ☐ Water treatment

< Previous Finish Cancel

Version 24.0.1.5

C:\Users\...S\Plant\Aox_inj_File\ImportFolders.ini

PROJECT MANAGER
Current Project: Project Folder Structure Sample

Project

- Project Folder Structure Sample
 - P&ID Drawings
 - Plant 3D Drawings
 - Pipe Specs
 - Related Files

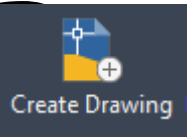
Orthos

Project Folder Structure Sample

- Orthographic Drawings

NTI TOOLS DOCUMENT WIZARD

Create Drawing



PROJECT MANAGER

Current Project:

Project NTi Plant Tools V2

Orthos

search

Project NTi Plant Tools V2

Orthographic Drawings

CIP

FU Maskine Piping-0001.dwg

123DOrtho

12ss

GA1-T1

Source Files

Orthographic DWG

Isometric DWG

Details

Status: File is accessible

Name: FU Maskine Piping-0001.dwg.dwg

File location: C:\Users\pdh\OneDrive - NTI A S\Dokumenter\Proj

DocFile_RevisionName: Unknown

Number: FU Maskine Piping-0001

File is locked by user 'pdh' on machine 'DKLAP1010 '

File size: 217,58KB (222,797 bytes)

File creator: PDH

Last saved: 15. september 2021 11:13:59

Last edited by: Unknown

Description: Pipe Design 1

Drawing Properties

General

DWG Number

FU Maskine Piping-0001

DWG Title

FU Maskine Piping-0001

Drawing Area

CIP

Author

PDH

Description

Pipe Design 1

Description

OK

Cancel

Help

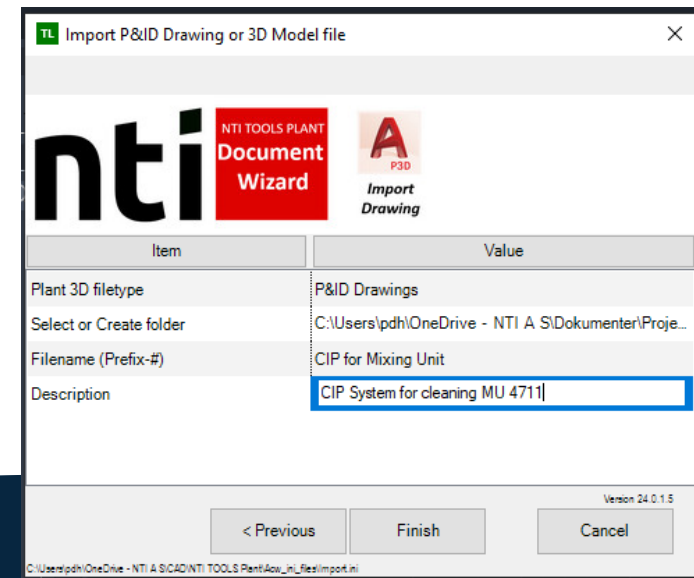
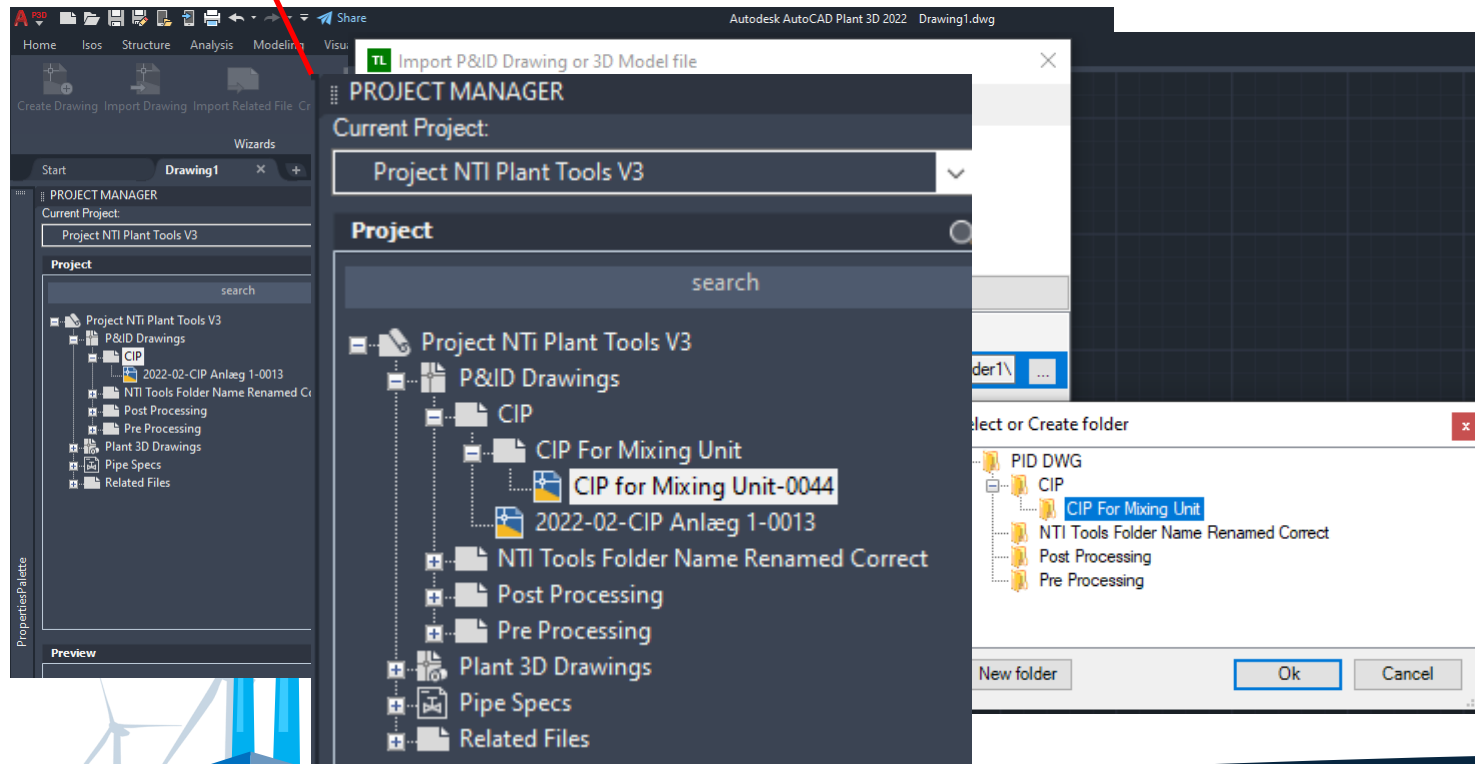
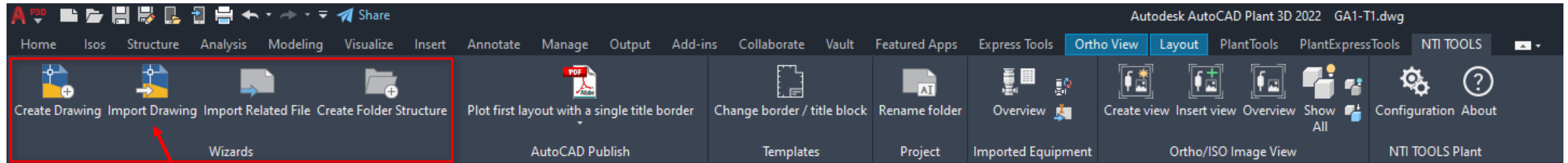
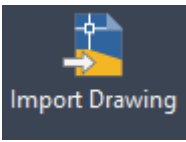
This drawing is the intellectual property of NTI A/S and may not be shown to third parties without our permission.		nti		NTI A/S Jens Ravns Vej 11B DK-7100 Vejle Denmark		Date:		Sign.:	
Pipe and steel member length in any part list are for guidance only and shall be checked before use as cutting length.						Created		15-09-21	
						Released			
						Approved			
						Project: 2022-02			
						Unit:			
						Drg. No.		Rev.	
						FU Maskine Piping-0001		####	

Last saved: 15. september 2021 11:13:59
Last edited by: Unknown
Description: Pipe Design 1



NTI TOOLS DOCUMENT WIZARD

Import Drawing



Spørgsmål ?

