

# Product Design & Manufacturing Collection.

## What's new 2019

Lars Nyström

Technical Sales Specialist Autodesk – Northern Europe

AUTODESK® PRODUCT  
DESIGN & MANUFACTURING  
COLLECTION



AUTODESK

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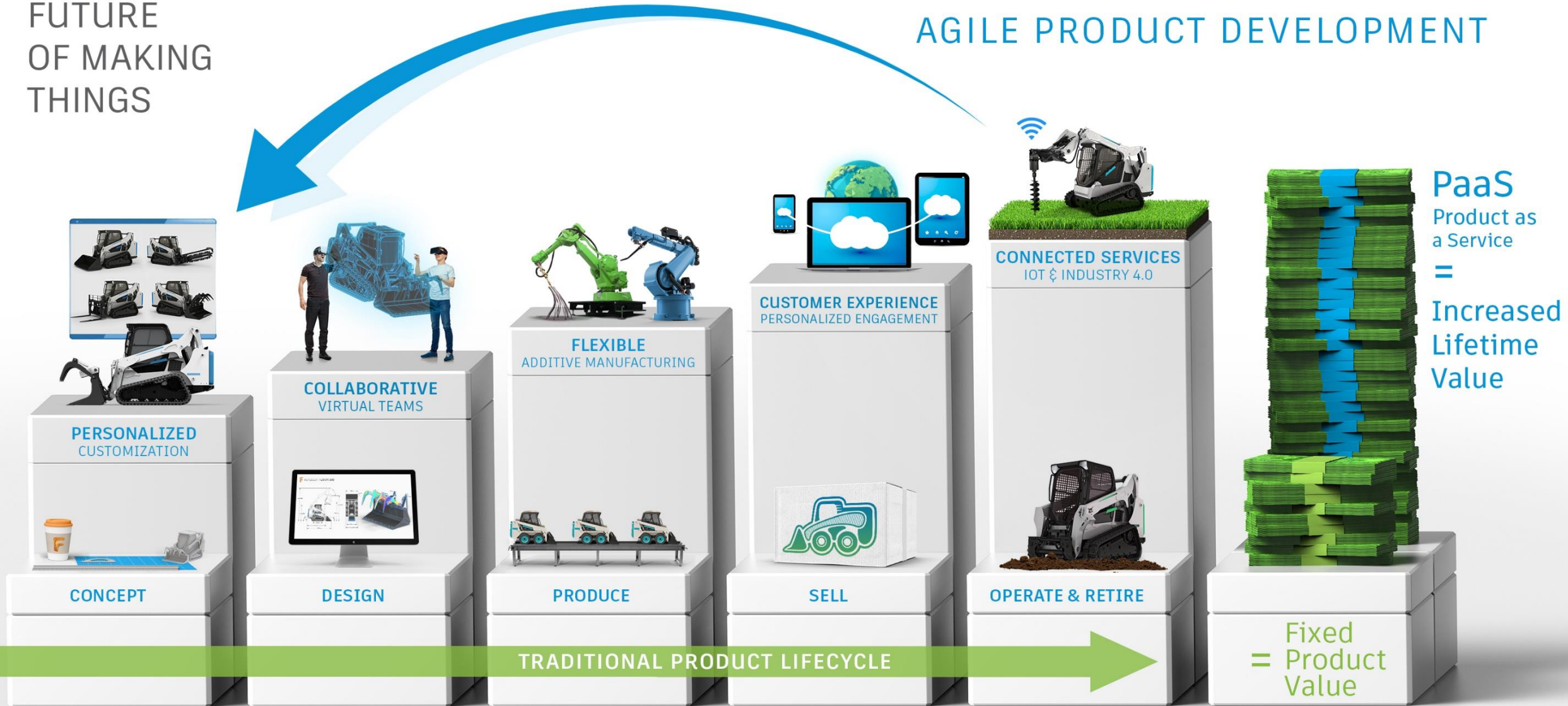
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# THE FUTURE OF MAKING THINGS

# AGILE PRODUCT DEVELOPMENT



THE  
FUTURE  
OF MAKING  
THINGS



# AUTODESK® PRODUCT DESIGN & MANUFACTURING COLLECTION



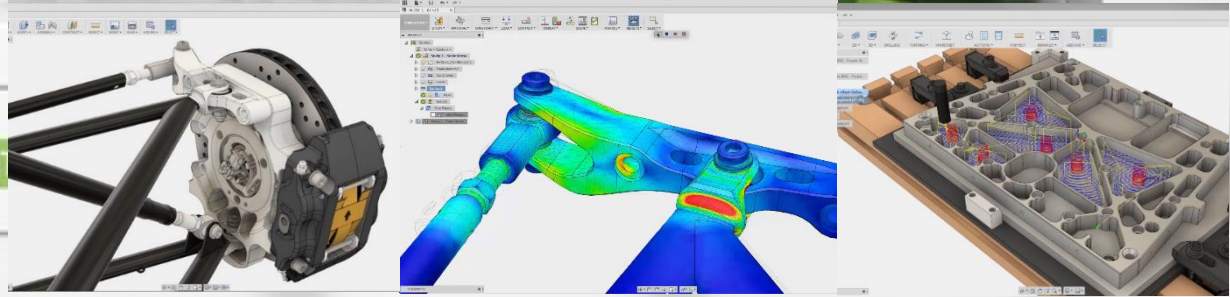
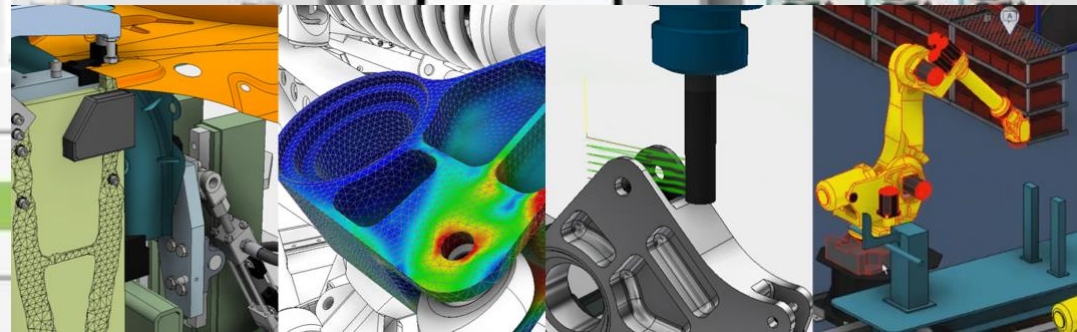
PaaS  
Product as  
a Service  
=  
Increased  
Lifetime  
Value

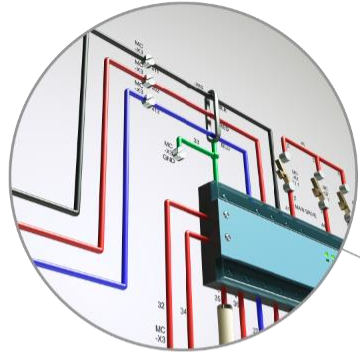


## AUTODESK® INVENTOR®



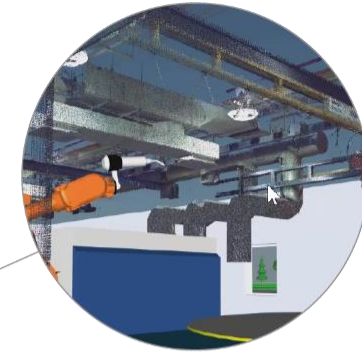
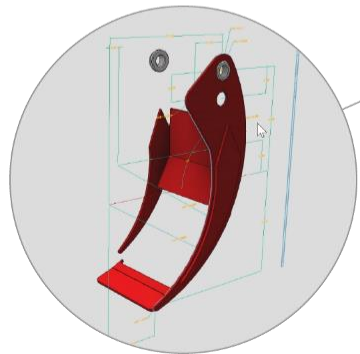
## AUTODESK® FUSION 360™





**ELECTROMECHANICAL  
INTEROPERABILITY**

**2D TO 3D  
INTEROPABILITY**

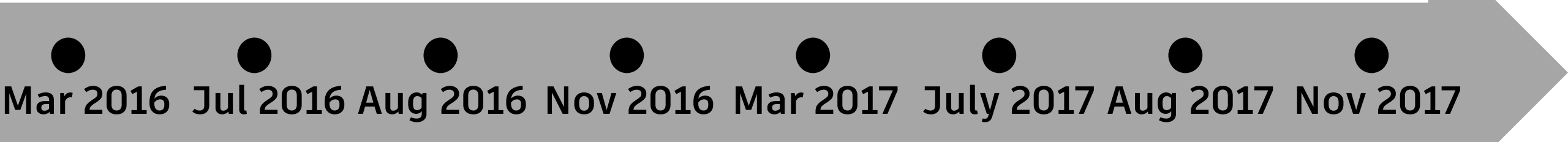


**REALITY CAPTURE**

**LARGE SCALE  
DESIGN REVIEW**



**ASSOCIATIVE WORKFLOWS WITH  
COMPLIMENTARY APPLICATIONS**



Mar 2016

Jul 2016

Aug 2016

Nov 2016

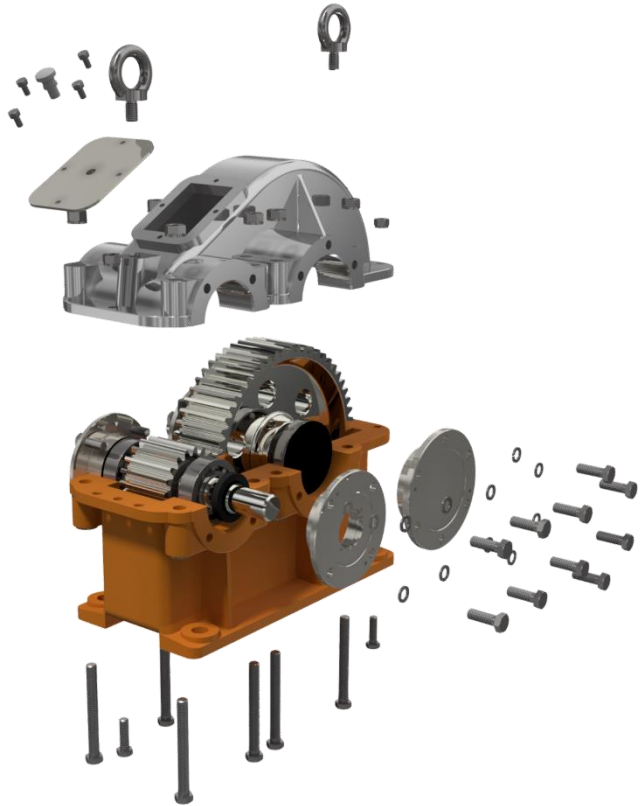
Mar 2017

July 2017

Aug 2017

Nov 2017

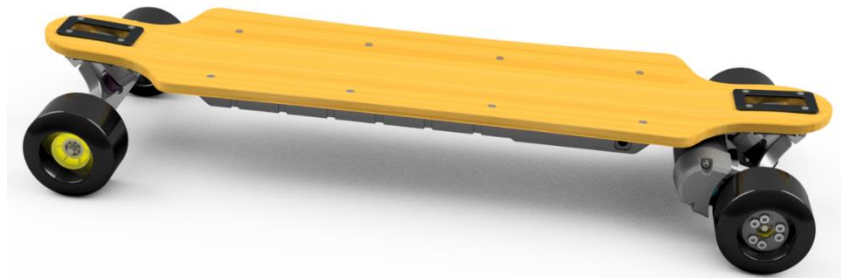
# Inventor 2019



**PROFESSIONAL GRADE**



**CONNECTED**



**INVENTOR EXPERIENCE**

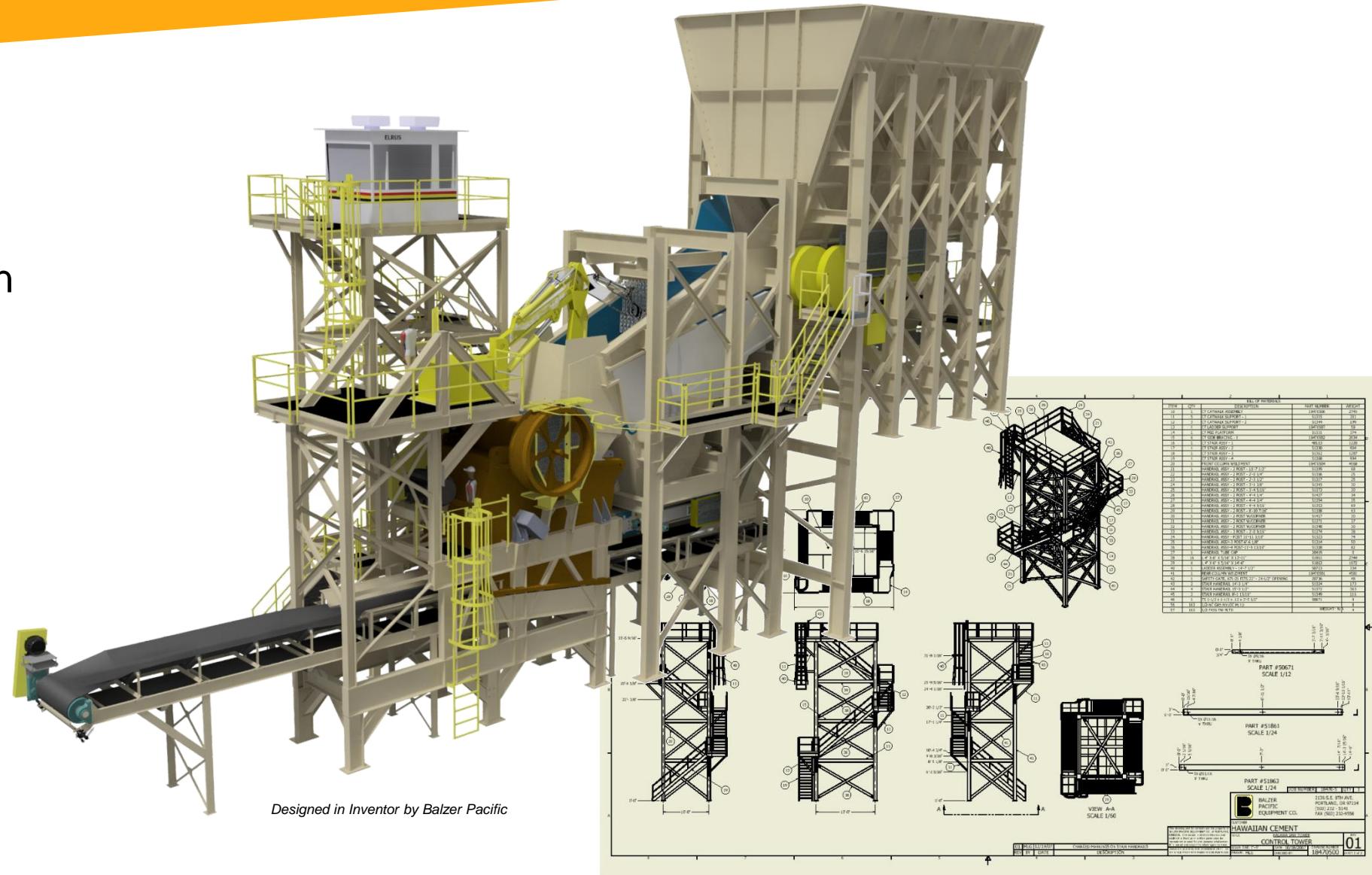
# Professional Grade





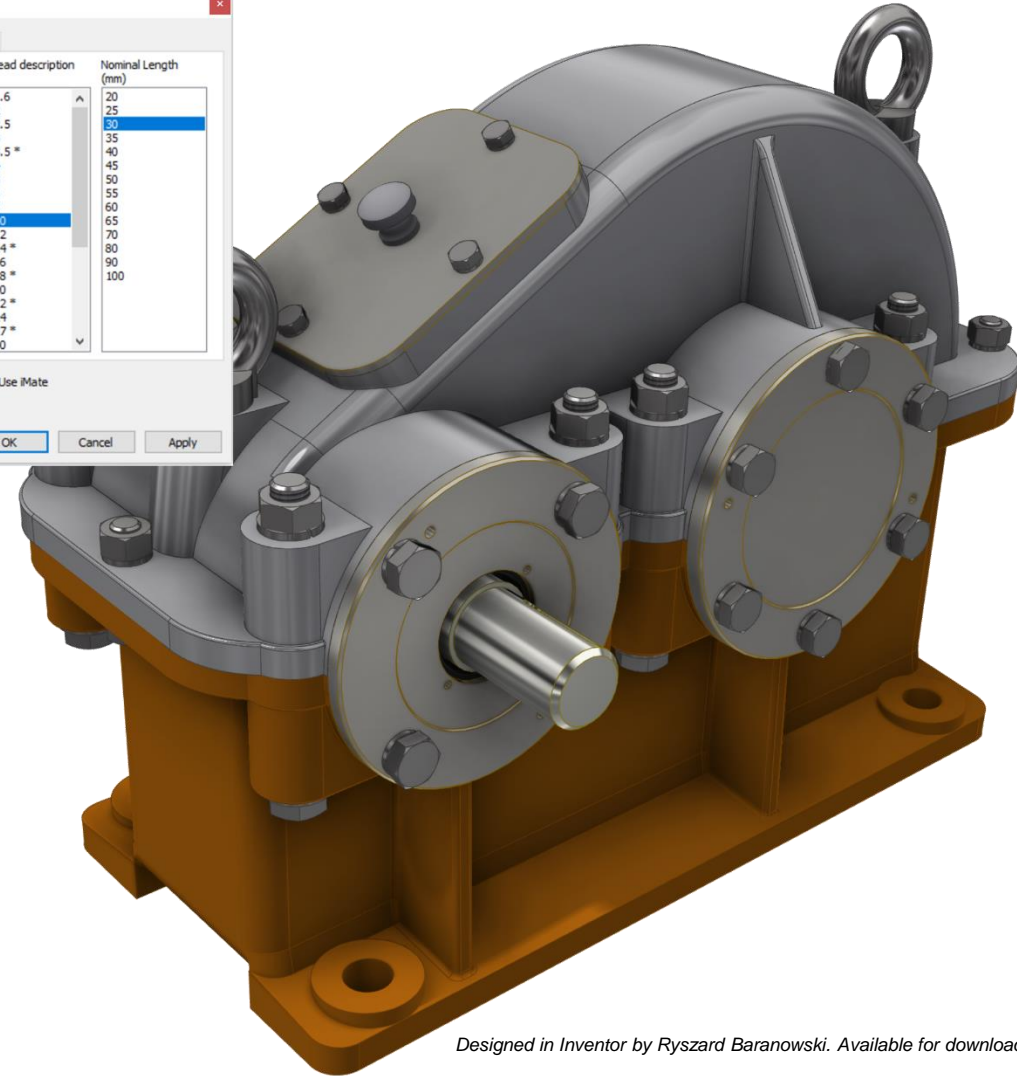
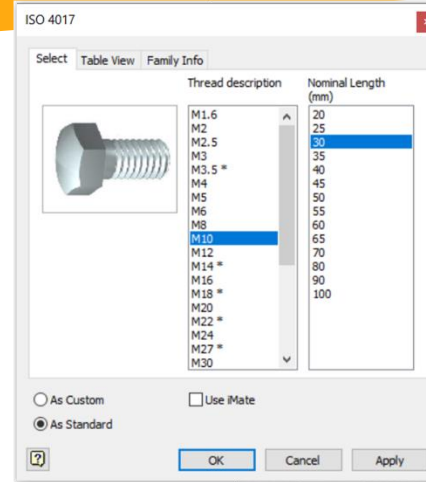
# Performance

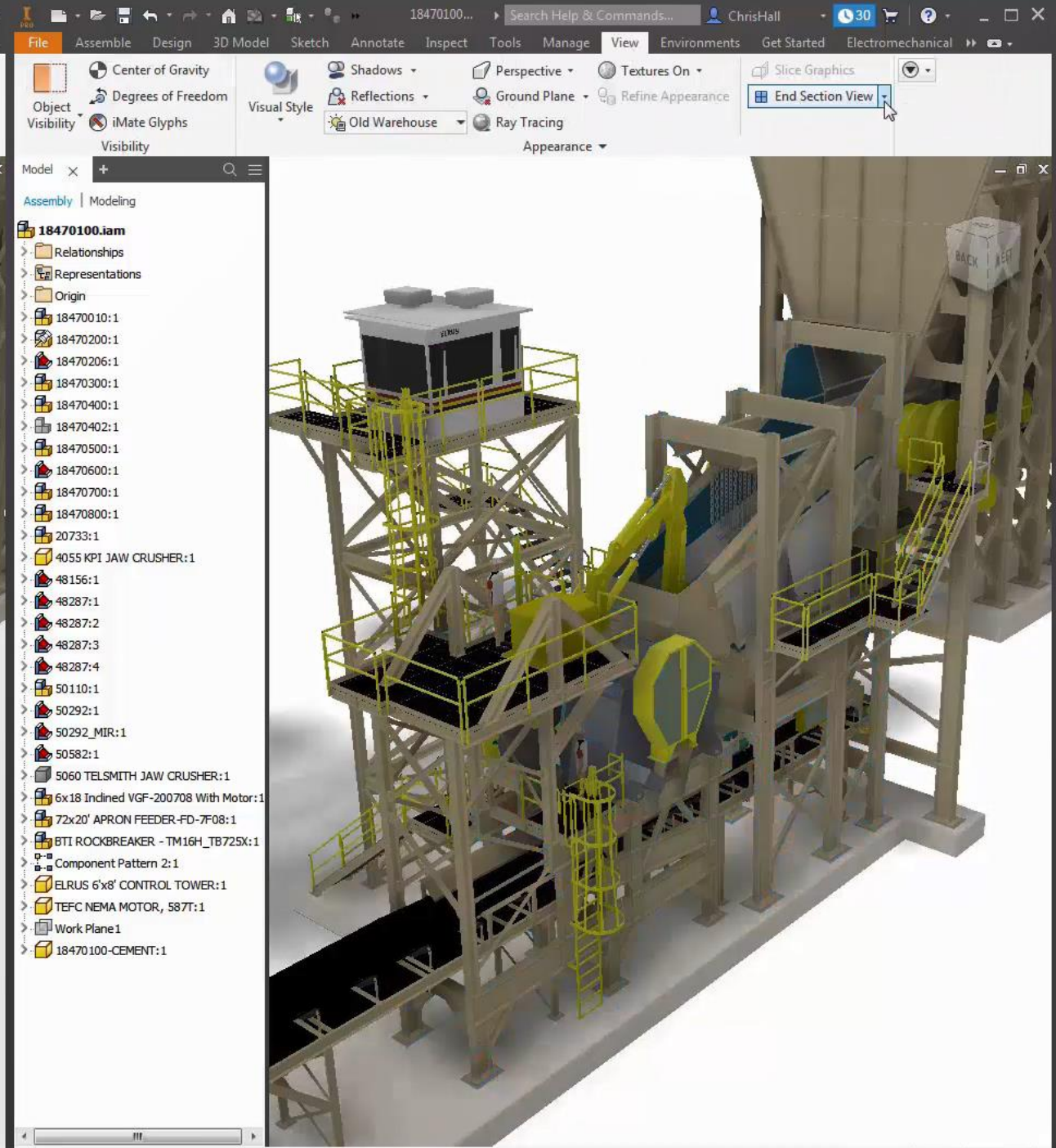
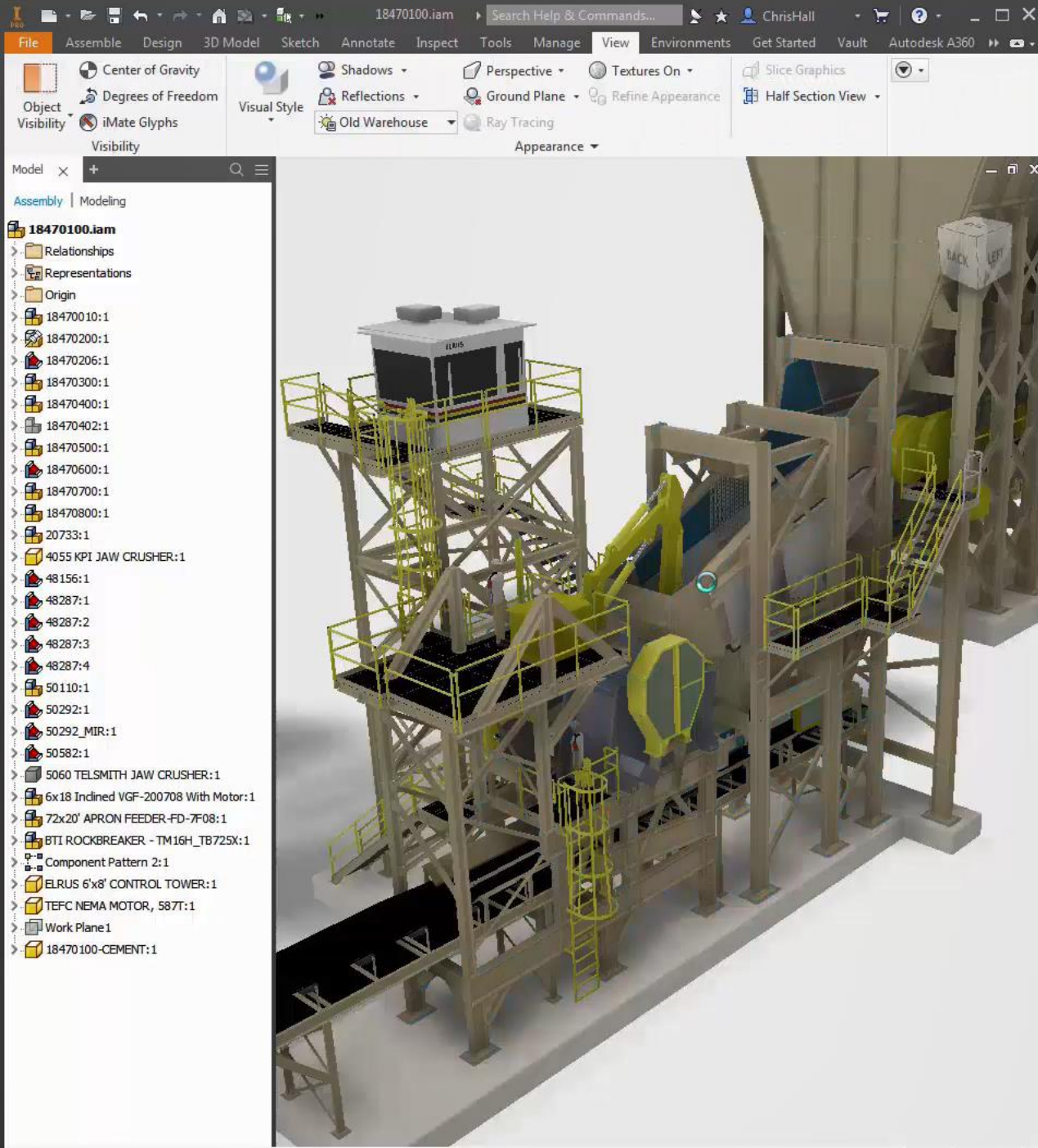
- ▶ Assemblies
  - ▶ Editing
  - ▶ Updates
  - ▶ Pattern Selection
- ▶ Drawings
  - ▶ View Creation
  - ▶ Updates
  - ▶ Navigation



# Performance

- ▶ General
  - ▶ Display of Threads
  - ▶ Mouse Wheel Zoom
  
- ▶ Content Center
  - ▶ In-Memory Caching





# iLogic

- ▶ Component and Management
  - ▶ Add/Delete Parts
  - ▶ Add/ Delete Assemblies
  - ▶ Add/Delete Constraints
- ▶ Capture Current model state
- ▶ Assign Geometry Names



Designed in Inventor by Balzer Pacific

Model iLogic x +

Rules **Geometry** Forms Global Fo

Named Geometry

leftMountingFace

Assign Name...

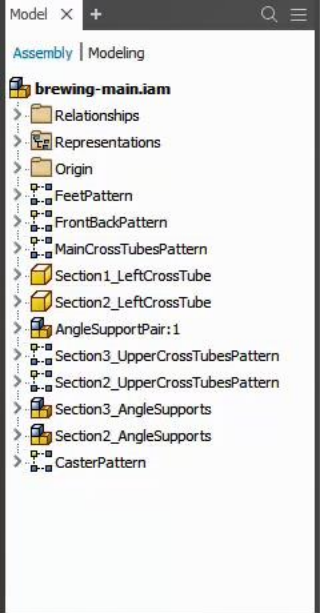
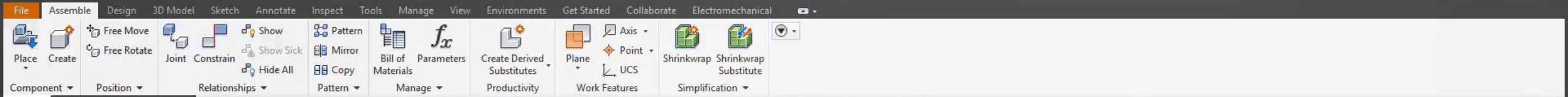
Snippets

System Custom

- Parameters
- Features
- Components (classic)
  - iLogic Assemblies/Components
    - Manage Components
    - Add Component
    - Add iPart
    - Add Circular Pattern
    - Add Rectangular Pattern
    - Add Feature Based Pattern
    - Delete Component
    - Delete Pattern
    - ThisAssembly
    - Get Appearance Asset
    - Get App
  - Positioning
    - Create e
    - Transla
    - Transla
    - Get tra
    - Create D
    - Add vec
    - Subtrac

```

ThisAssembly.BeginManage ()
If OptionA Then
    Components.Add("Occ A", "FileA.ipt")
End If
ThisAssembly.EndManage ()
    
```



**Configure**

Tiers: 3 Tier

kettleSize: 1 Tier, 2 Tier, 3 Tier

burnerType:  Banjo,  Small

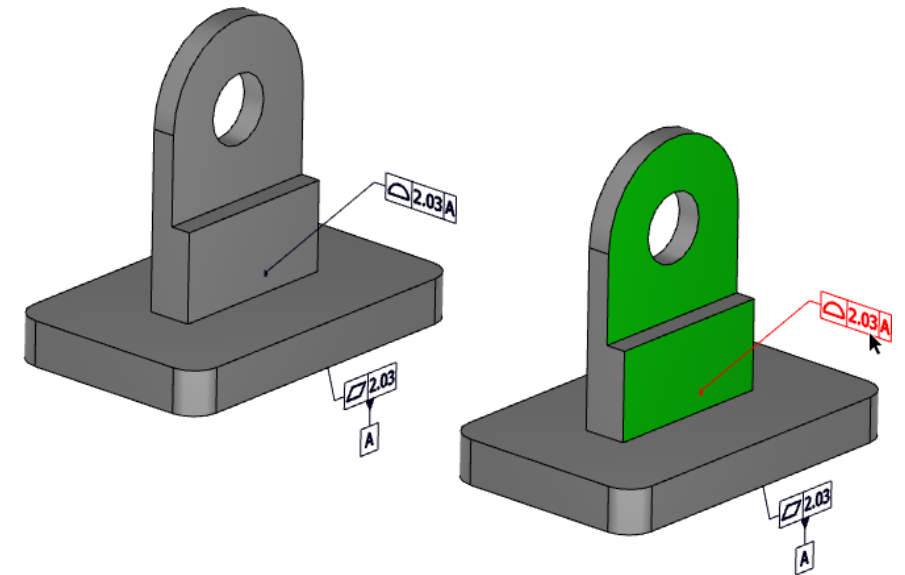
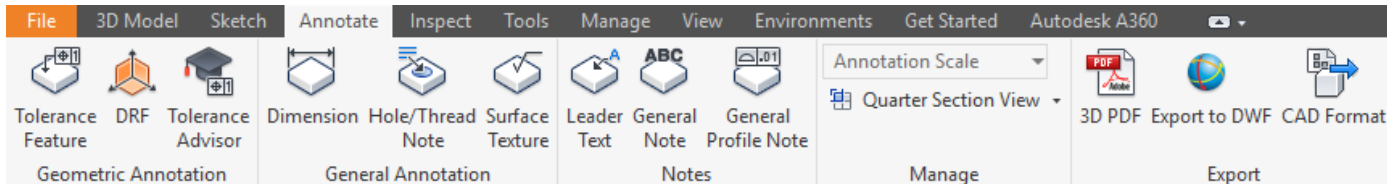
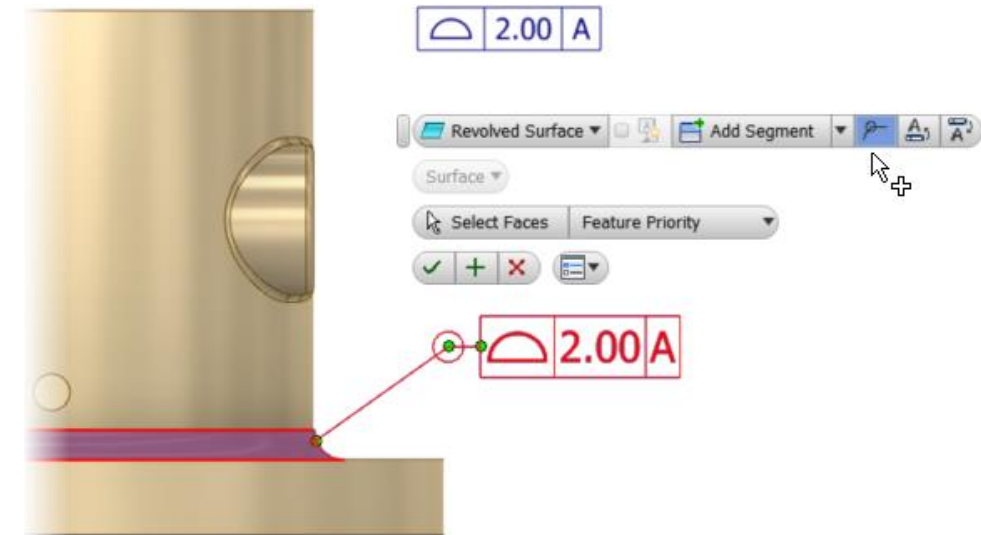
boilOverTrays:

casters:

Done



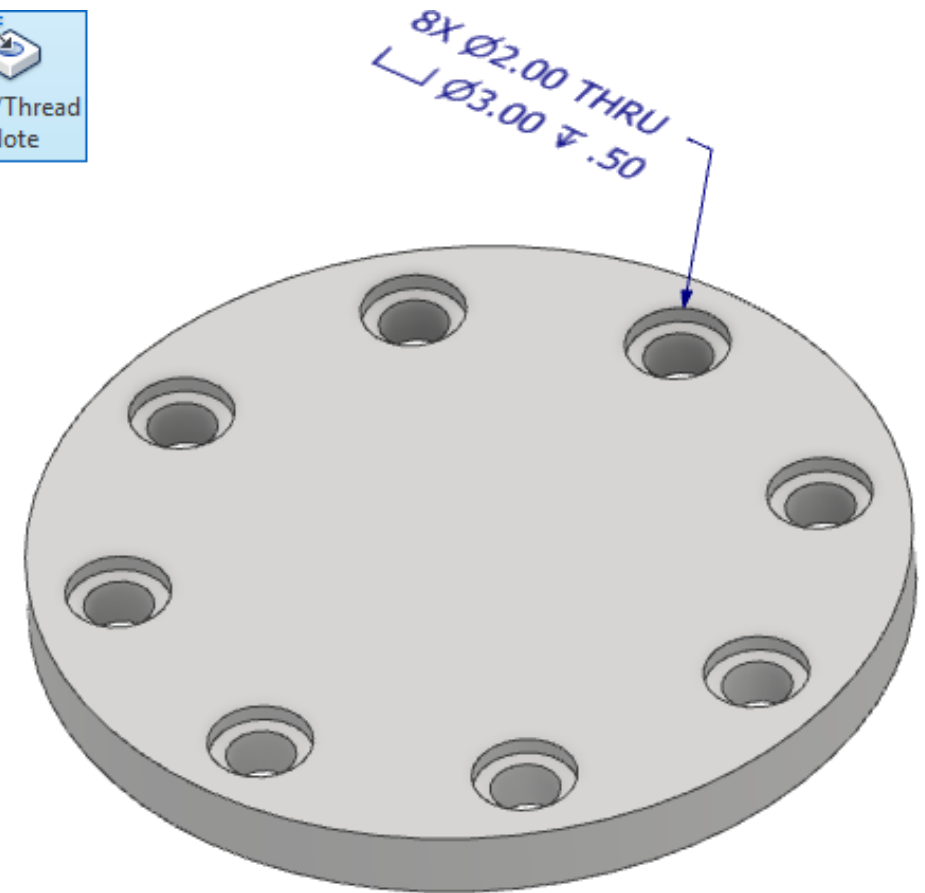
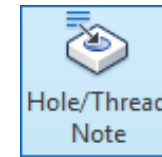
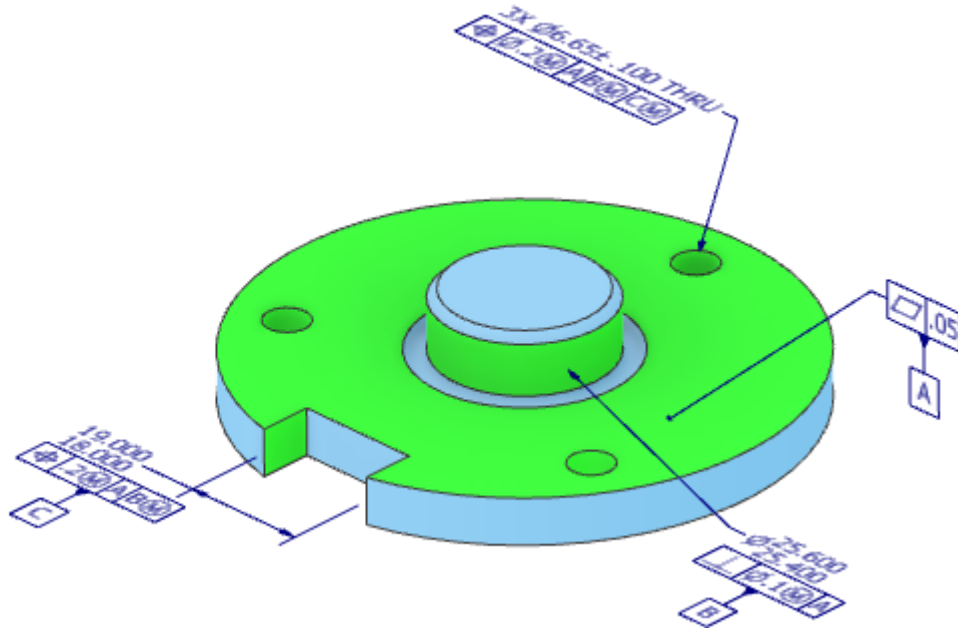
- ▶ New tolerance feature annotation
- ▶ 3D Annotations for Assemblies
- ▶ All-around symbol for Profile of a Surface.
- ▶ DWF Export
- ▶ 3D PDF export
  - ▶ Associative face highlight for tolerance annotations that reference multiple faces.



- ▶ Tolerance Advisor Face Status
- ▶ 3D Annotation Hole/Thread Quantity

Constraint State Legend

- Fully Constrained
- Partially Constrained
- Unconstrained
- Constrained by Surface Profile
- Face Status Coloring (On)



File Assemble Design 3D Model Sketch Annotate Inspect Tools Manage View Environments Get Started Collaborate Simulation

Dimension Hole/Thread Surface Leader General  
Note Note Texture Text Note

General Annotation Notes

Auto (6.97)

Quarter Section View

3D PDF Export to DWF

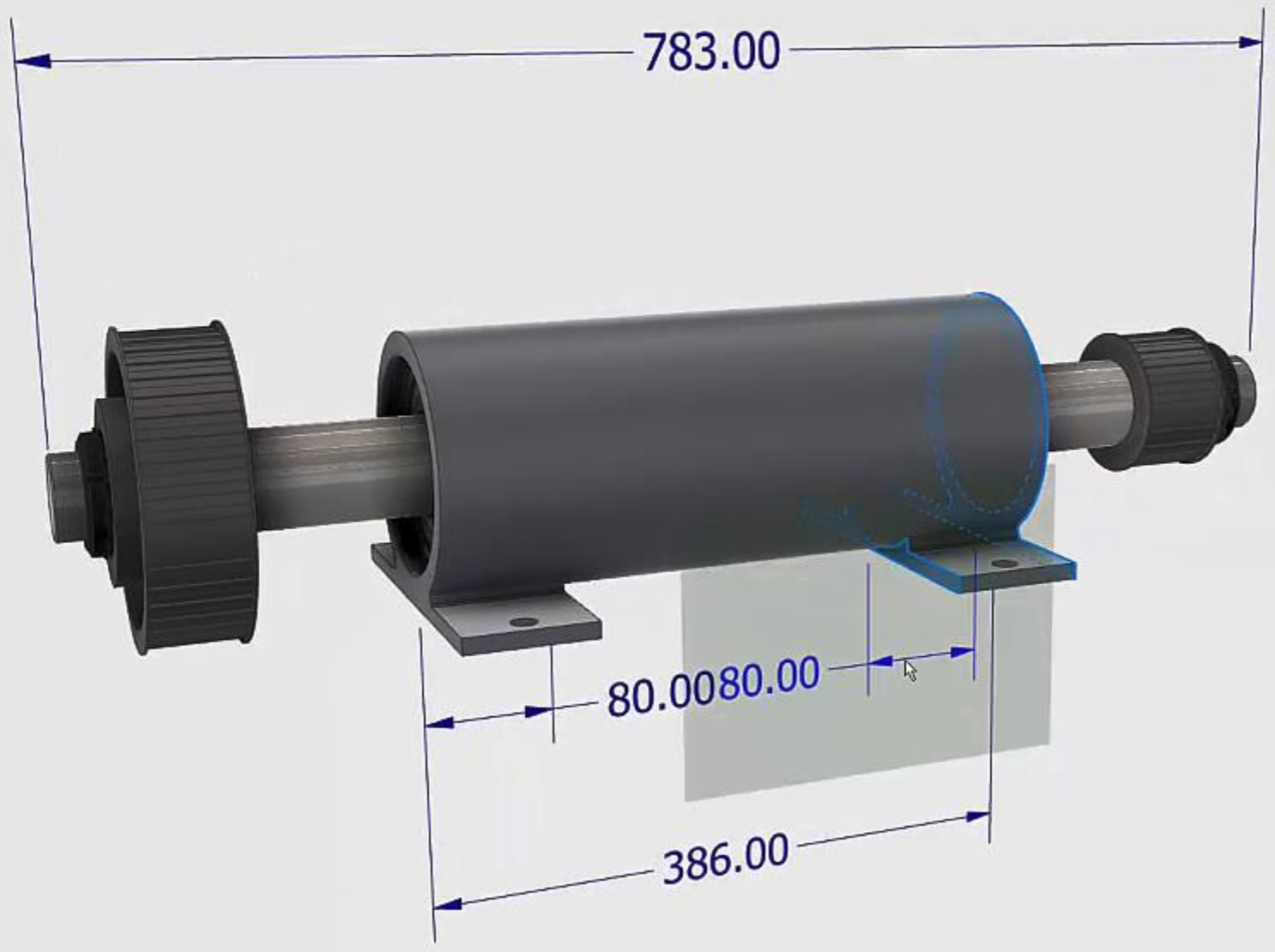
Manage Export

Model x +

Assembly | Modeling

Spindle.iam

- Relationships
- Representations
  - View: Default
    - Master
    - Default
    - View 1
  - Position
  - Level of Detail: Master
- Annotations
- Origin
- Housing:1
- SKF\_Bearing\_e2\_6312-2z\_2:1
- SKF\_Bearing\_e2\_6312-2z\_2:2
- Shaft:1
- a9-44h200-2012\_01:1
- a9-22h200-1610\_01:1
- washer\_mb 10:1
- washer\_mb 10:2
- nut\_lm 10:1
- nut\_lm 10:2
- ring\_3bm 1-60:1
- ring\_3bm 1-60:2
- crclps\_din472\_130\_4:1
- dn6885\_st\_steel\_8x7x45:1
- dn6885\_st\_steel\_8x7x45:2



RIGHT

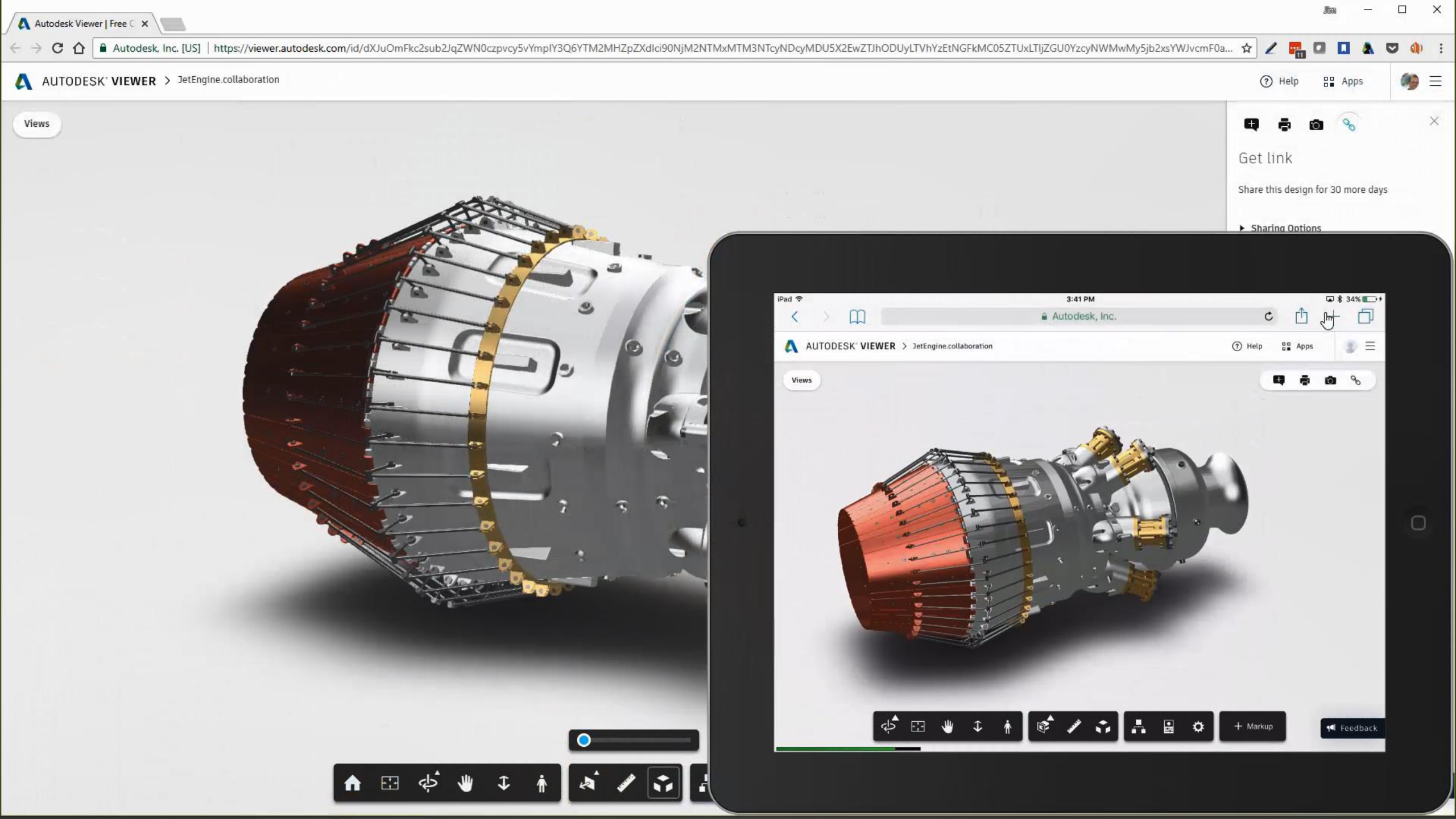
Navigation icons: Home, Rotate, Pan, Zoom, etc.





Connected





Views

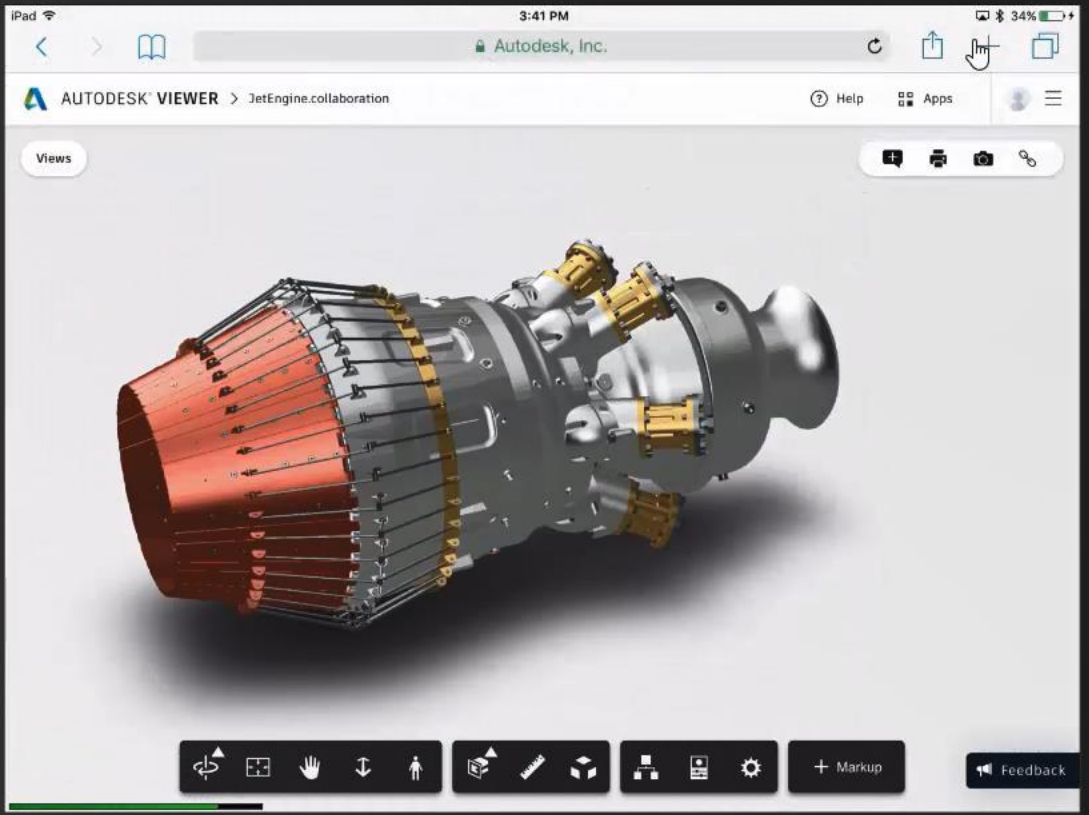
Help Apps



Get link

Share this design for 30 more days

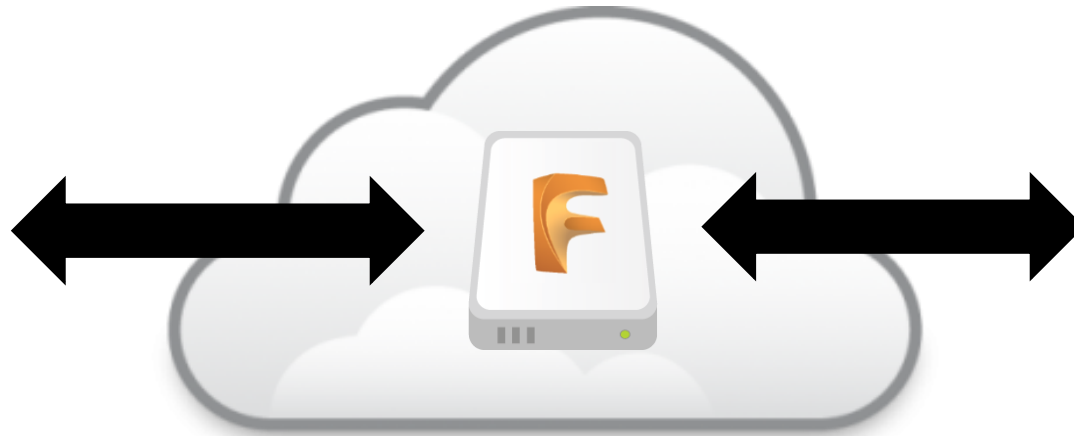
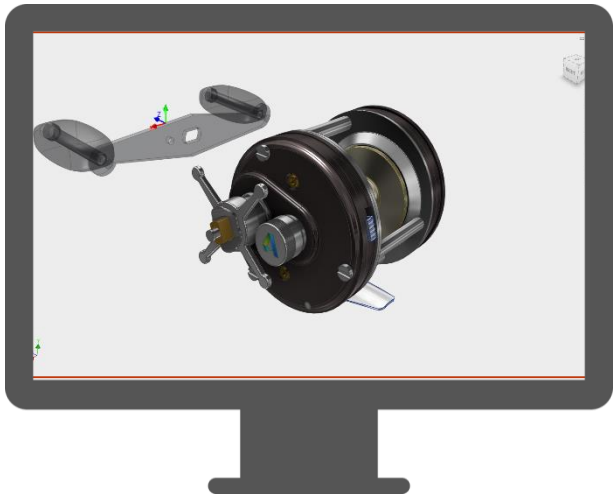
Sharing Options



Feedback

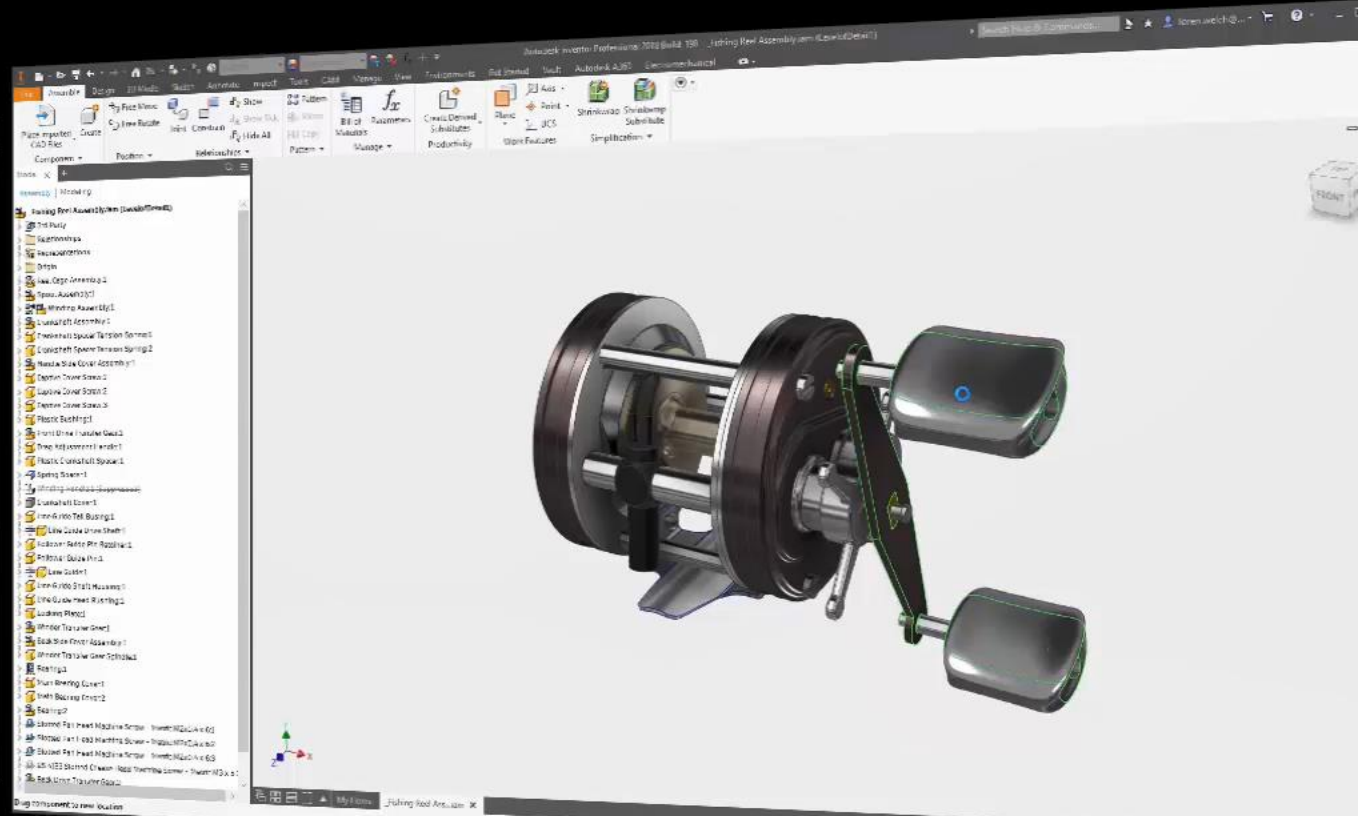
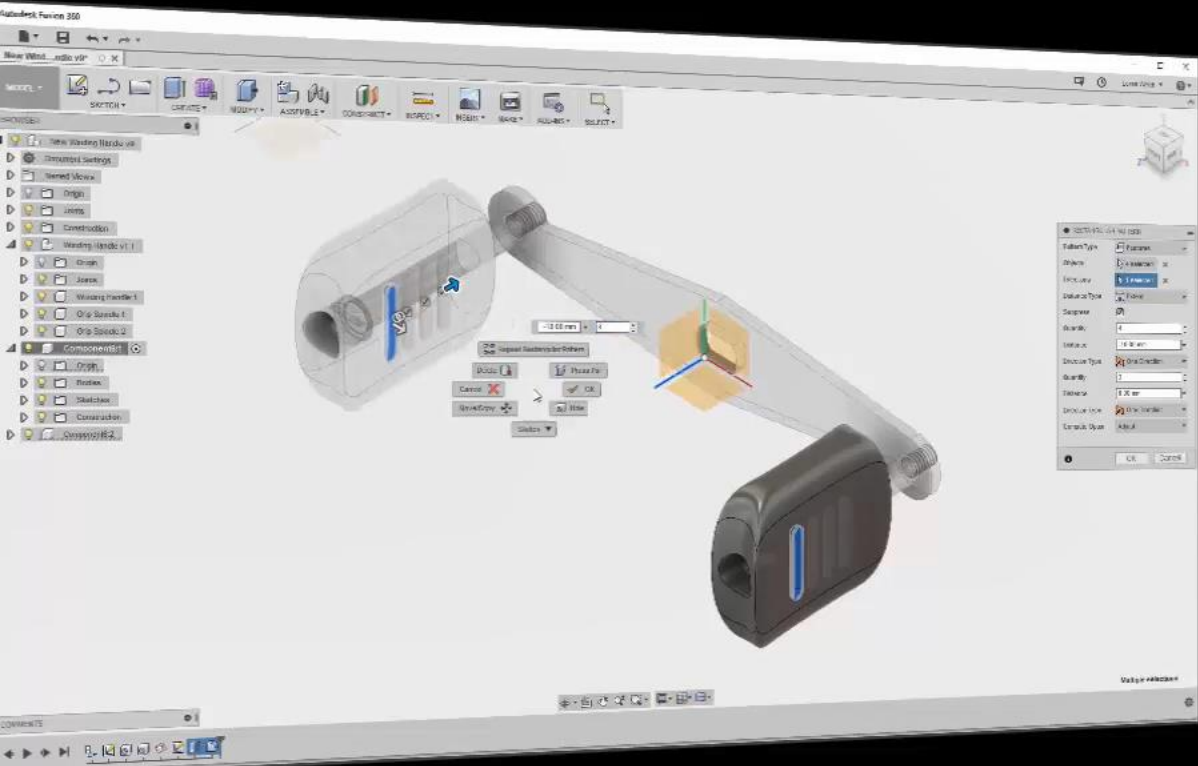
# Inventor and Fusion 360 AnyCAD

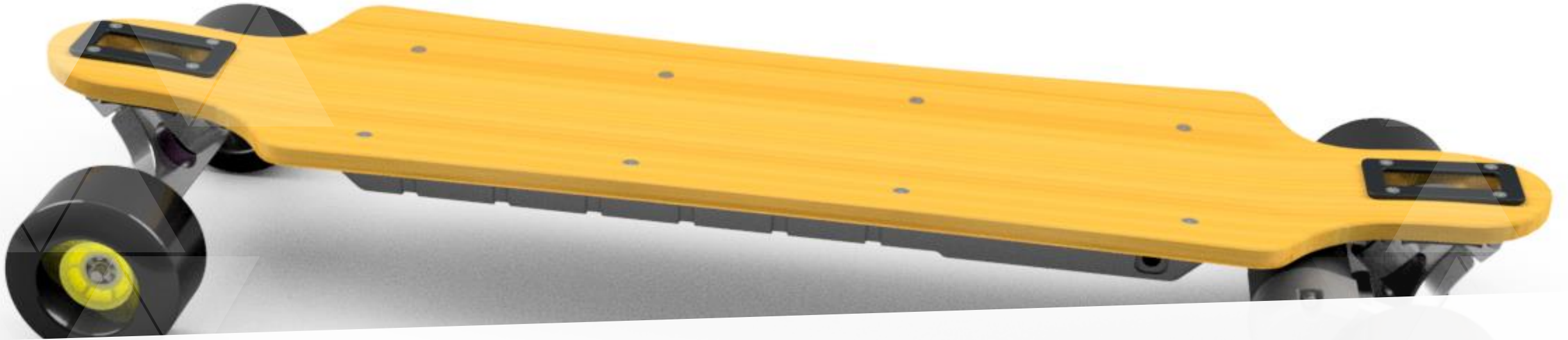
**I** AUTODESK®  
INVENTOR®



**F** AUTODESK®  
FUSION 360™



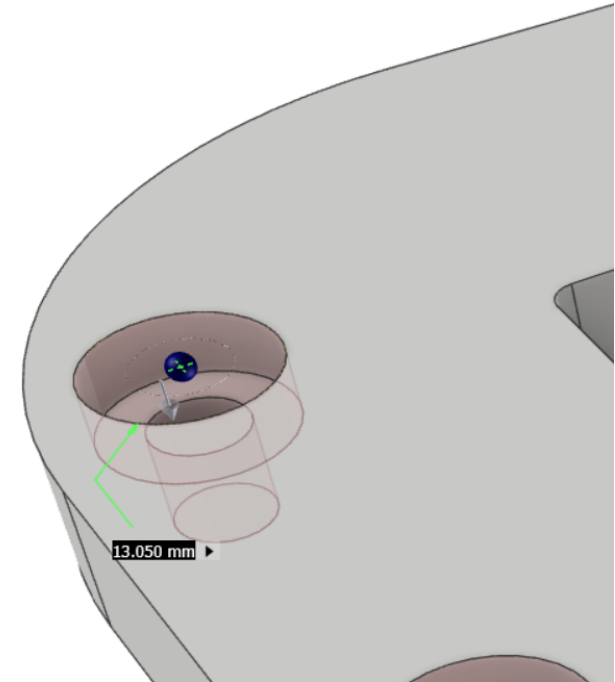
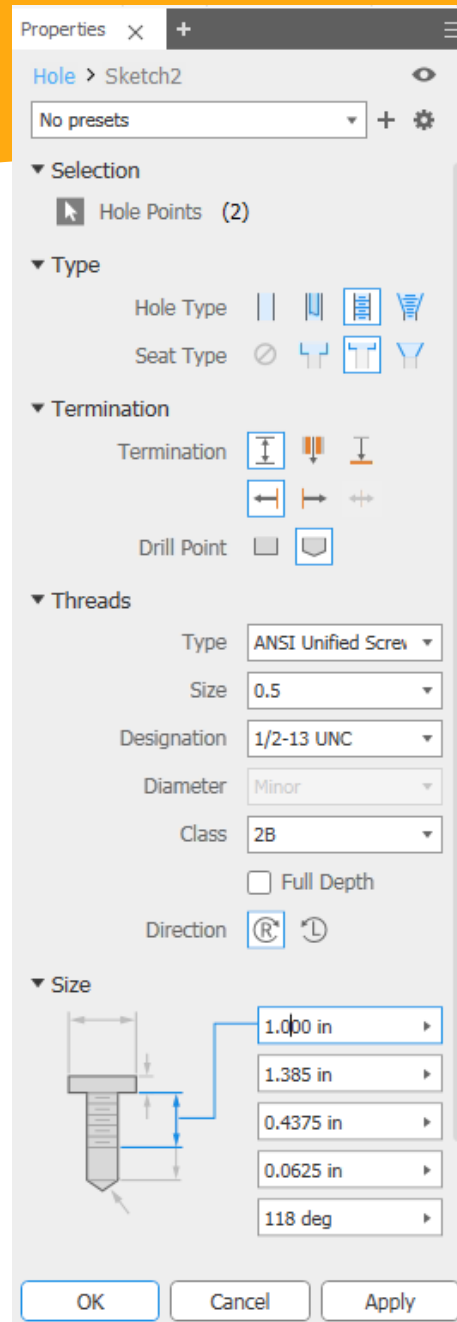


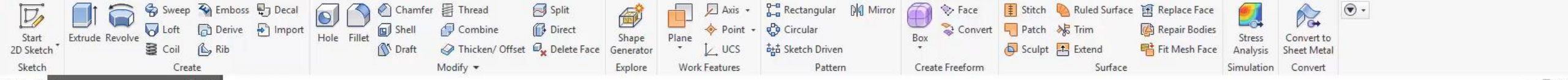


# Inventor Experience

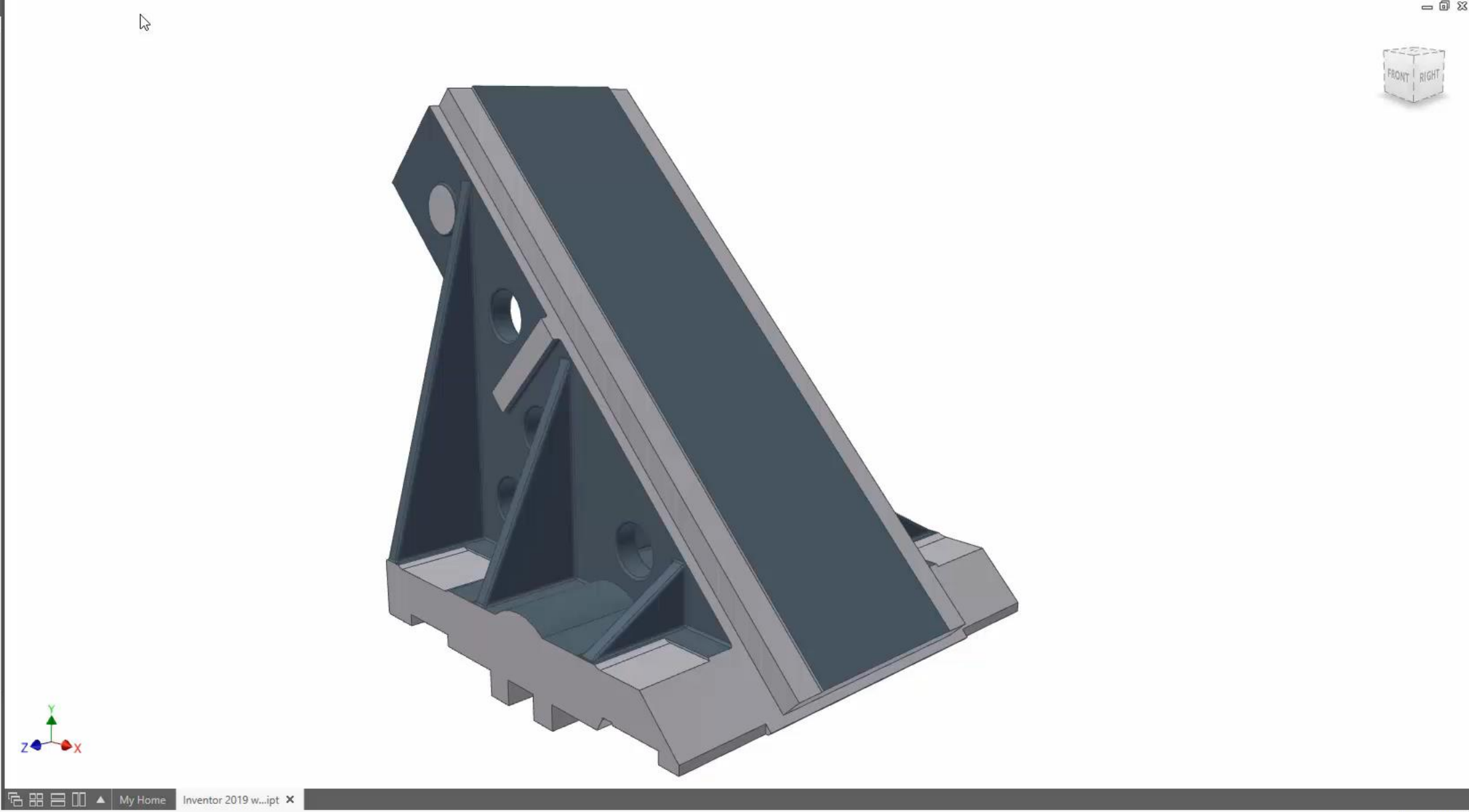
# Hole Command

- ▶ Panel UX
- ▶ Presets for:
  - ▶ Hole Type Group
  - ▶ Termination
  - ▶ Threads/Fasteners
  - ▶ Size
  - ▶ Advanced Settings
- ▶ Create & Edit Sketch





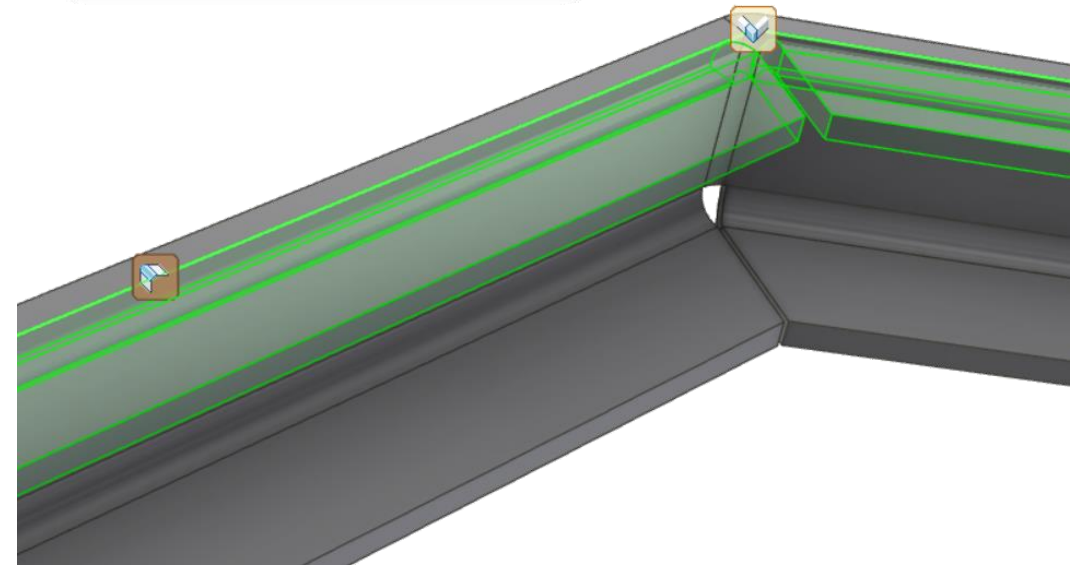
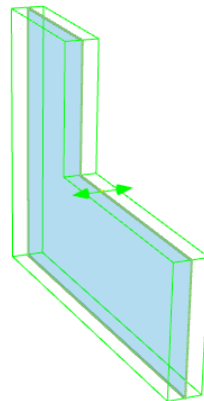
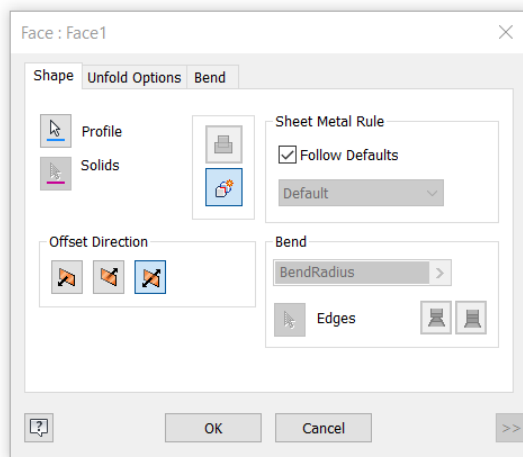
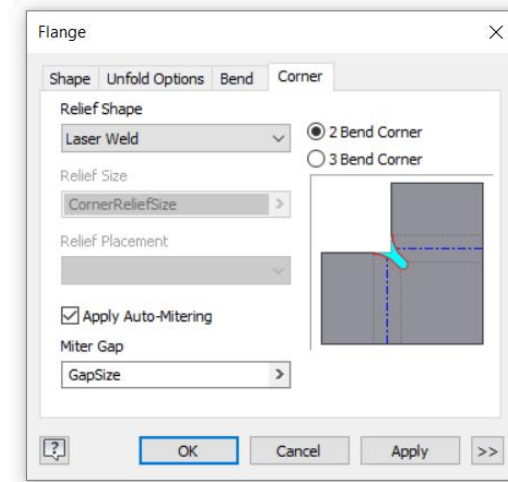
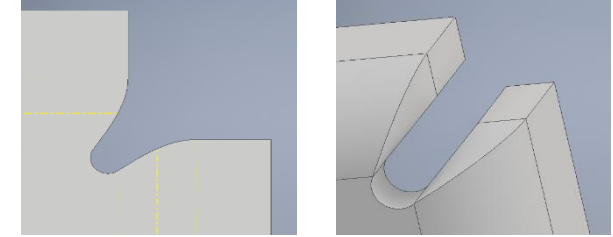
- Model x +
- Inventor 2019 whats new hole-1.ipt
  - Solid Bodies(1)
  - View: Master
  - Origin
  - new ML 3000371.ipt
    - Extrusion 1
    - Extrusion 2
    - Hole 1 (Suppressed)
    - Extrusion 3
    - Rectangular-Pattern1 (Suppressed)
    - Sketch 7
    - Extrusion 4
    - Work Plane 3
    - Extrusion 6
    - Extrusion 7
    - Hole 2 (Suppressed)
    - Extrusion 8
    - Extrusion 9
    - Hole 4 (Suppressed)
    - Extrusion 10
    - Work Axis 1
    - Hole 5 (Suppressed)
    - Rectangular-Pattern2 (Suppressed)
    - Hole 6 (Suppressed)
    - Mirror 1 (Suppressed)
    - Extrusion 11
    - Hole 7 (Suppressed)
    - Hole 8 (Suppressed)
    - Extrusion 12
    - Extrusion 13
    - Work Axis 2
    - Hole 10 (Suppressed)
    - Hole 11 (Suppressed)
    - Hole 12 (Suppressed)
    - Hole 13 (Suppressed)
    - Hole 14 (Suppressed)
    - Hole 15 (Suppressed)
    - Extrusion 17
    - Extrusion 18
    - Extrusion 19
    - Extrusion 20
    - Extrusion 21
    - Hole 17 (Suppressed)
    - Circular-Pattern2 (Suppressed)

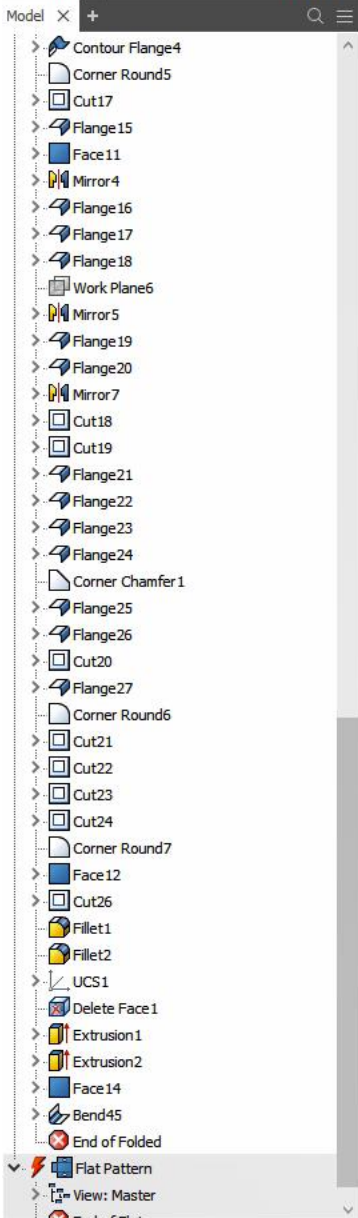
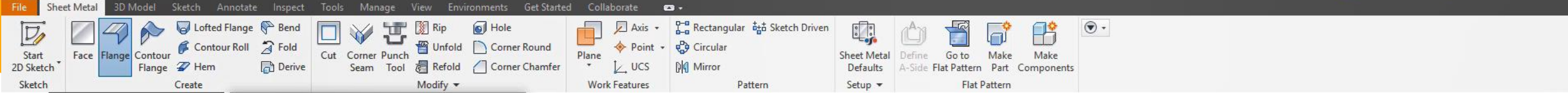




# Sheet Metal

- ▶ Mid-Plane Face Extrude
- ▶ Corner Enhancements
- ▶ Laser Weld Relief Shape

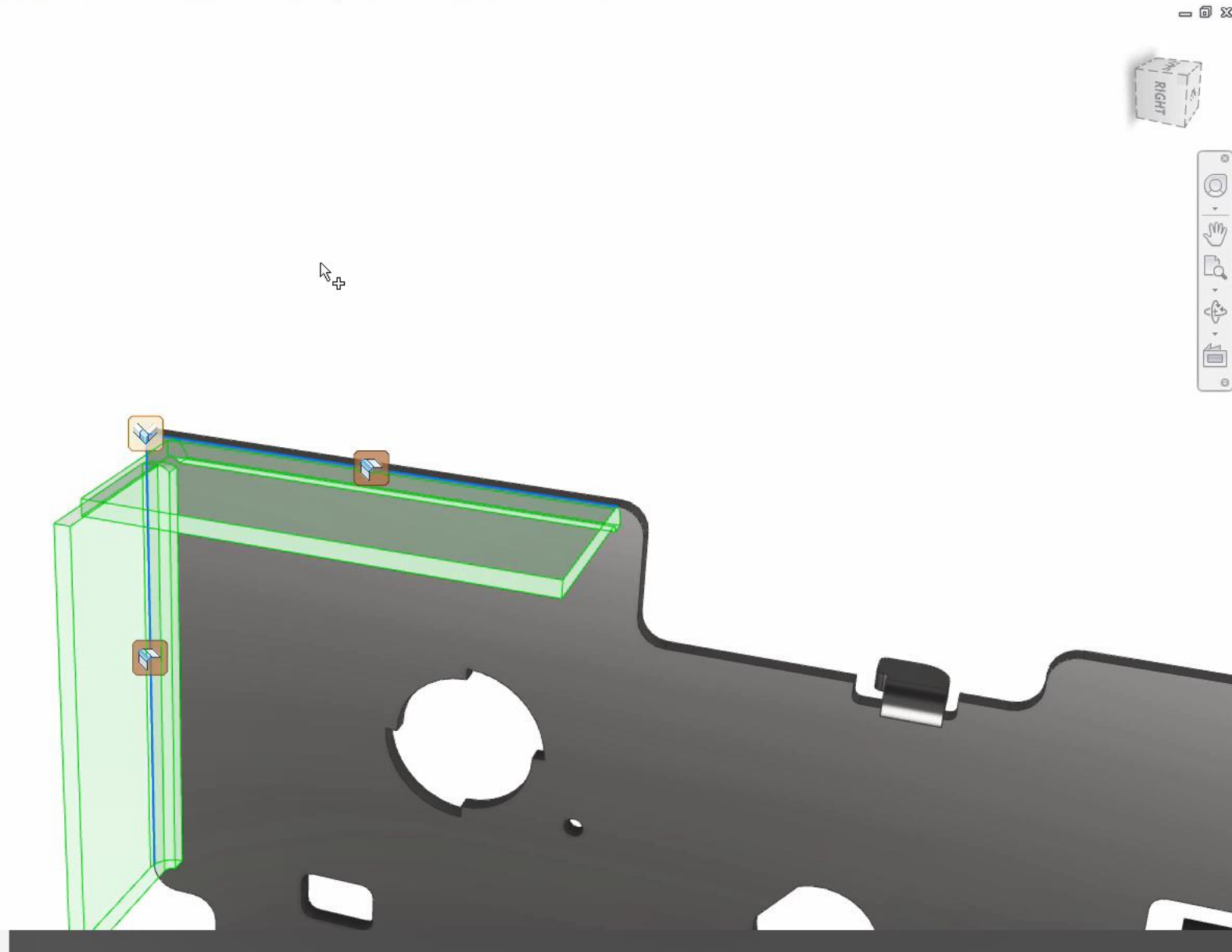




Flange dialog box with the following settings:

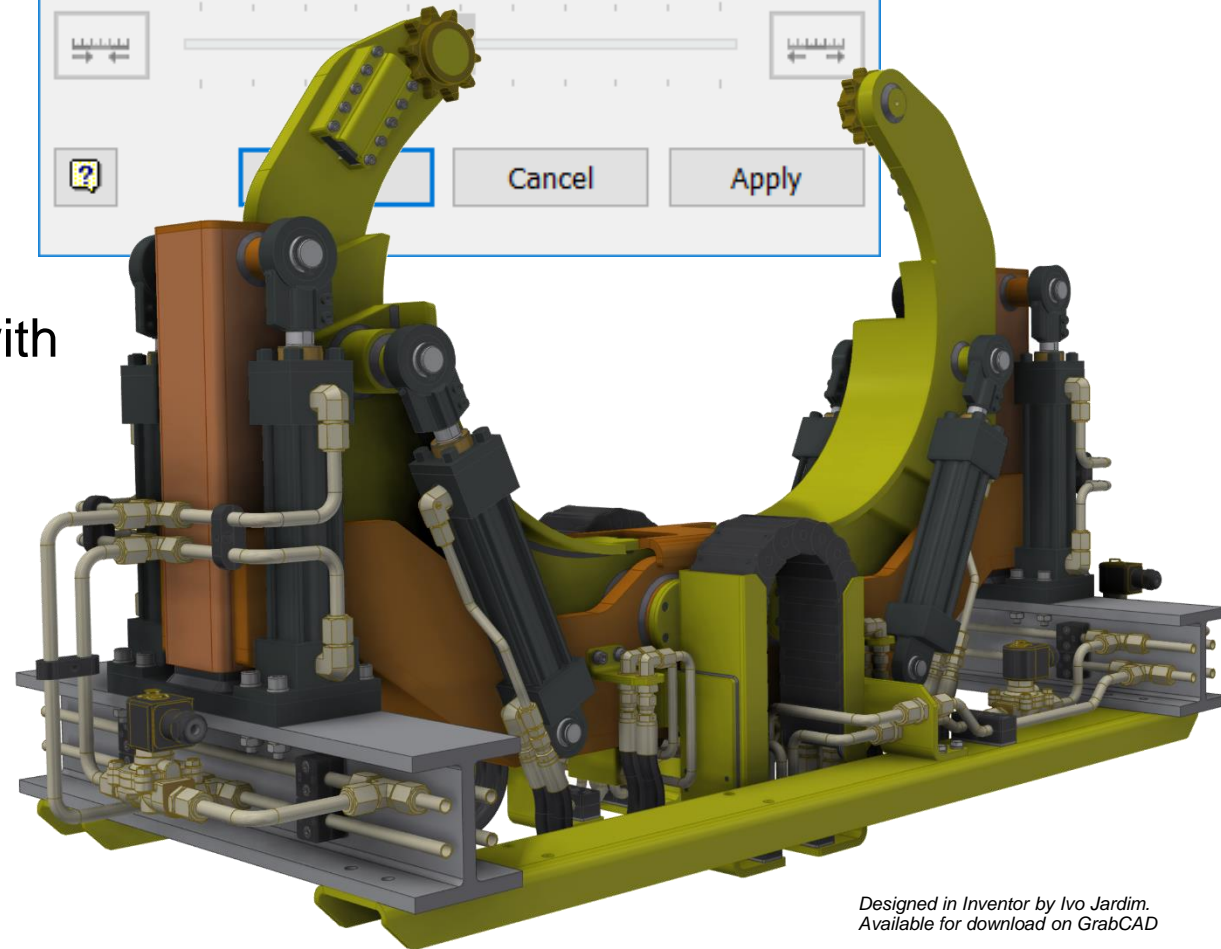
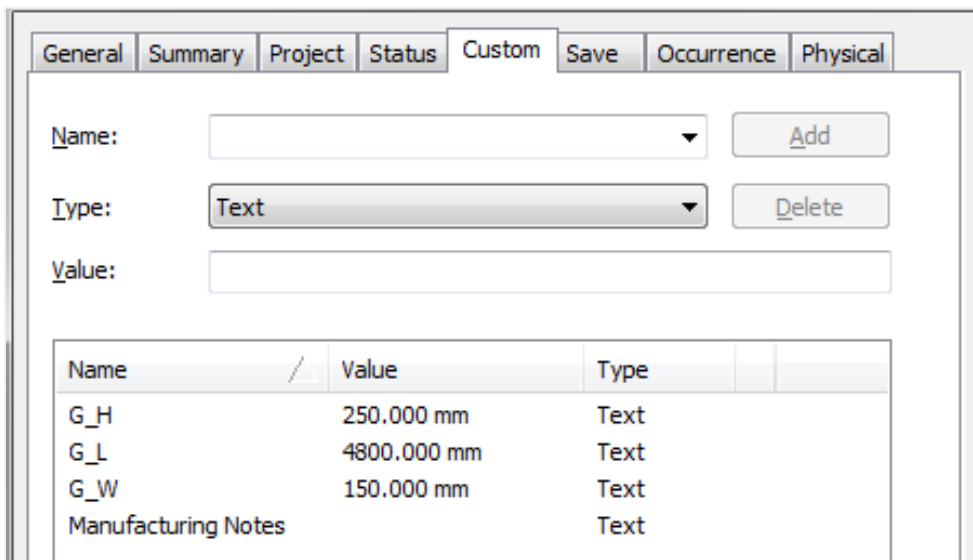
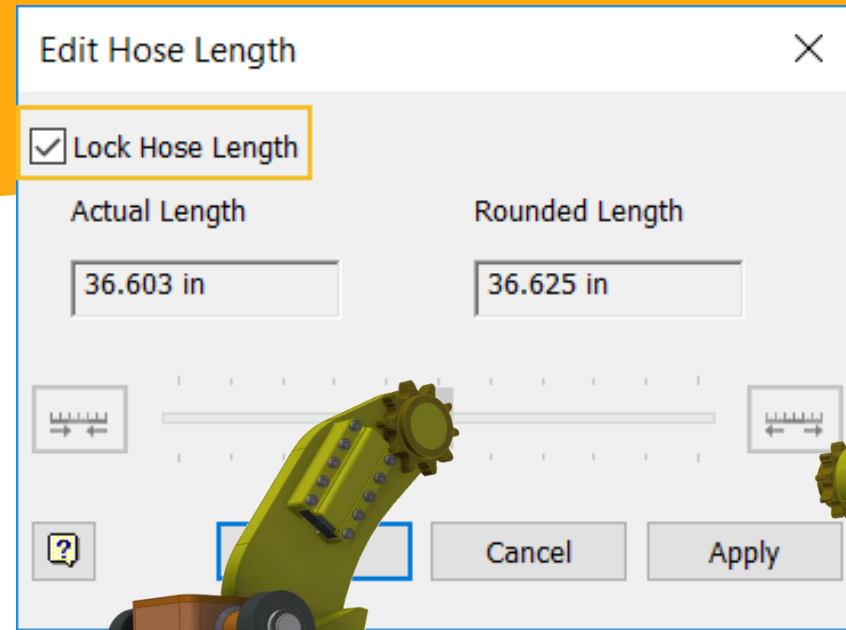
- Shape: Unfold Options
- Edges: 2 Selected (Click to add)
- Flange Angle: 90.0
- Bend Radius: BendRadius
- Height Extents: Distance (15)
- Height Datum: [Icons]
- Bend Position: [Icons]

Buttons: OK, Cancel, Apply, >>



# Tube & Pipe and Frame Generator

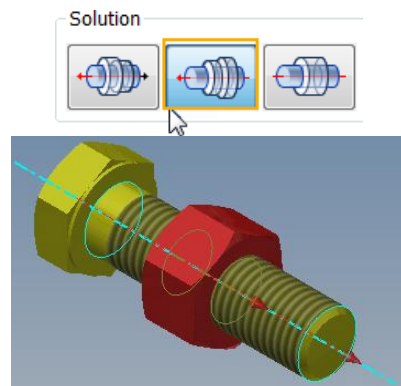
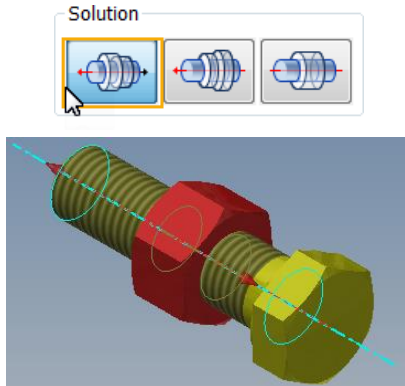
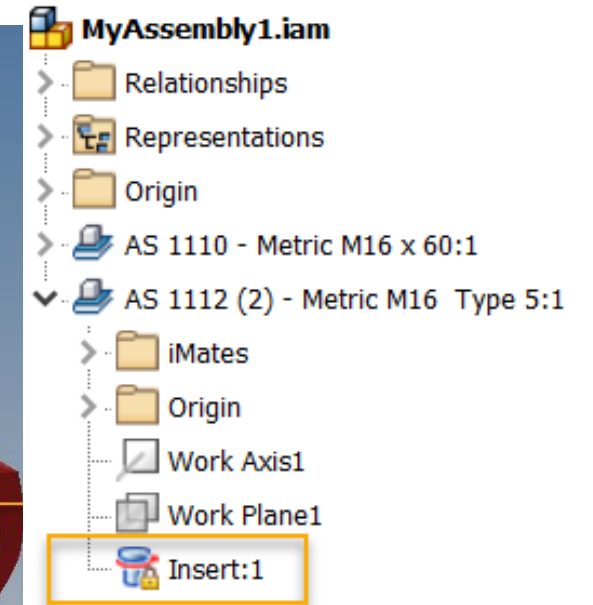
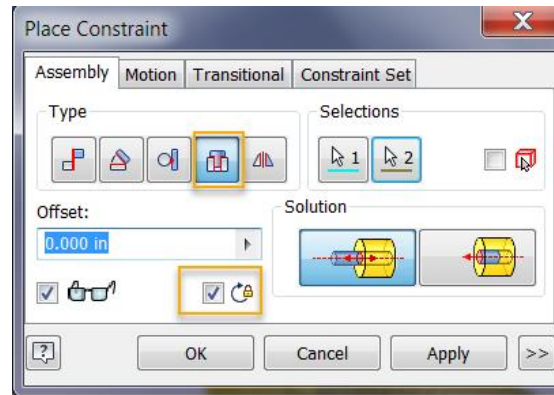
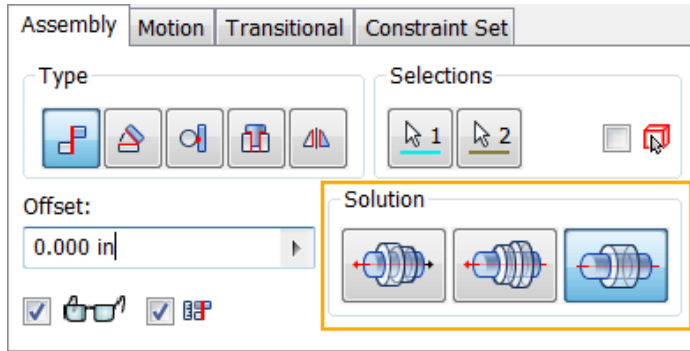
- ▶ Tube & Pipe
  - ▶ Lock Hose Length
  - ▶ Performance
  
- ▶ Frame Generator
  - ▶ CUTDETAIL enhancement for members with multiple end treatments



# Inventor Ideas

- ▶ Display Extended Browser Information
- ▶ Assembly Constraints
  - ▶ Lock Rotation
  - ▶ Opposed, Aligned & Undirected

- Thicken1 (Join x 1 mm)
- OffsetSrf1 (5 mm)
- Thicken2 (New Solid x 5 mm)
- Thicken3 (Cut x 1 mm)
- Thicken4 (Intersect x 0.5 mm)
- End of Part



Route

- Derived Route
- Edit Base Sketch
- Bends

Create

- Include Geometry
- Insert Node
- Move Node

Move Segment

Grounded Point

Dimension

Show Constraints

Constrain

Hydraulic Hose - Male/Fe

- Tube and Pipe Styles
- Hose Length

Manage

$f_x$  Parameters

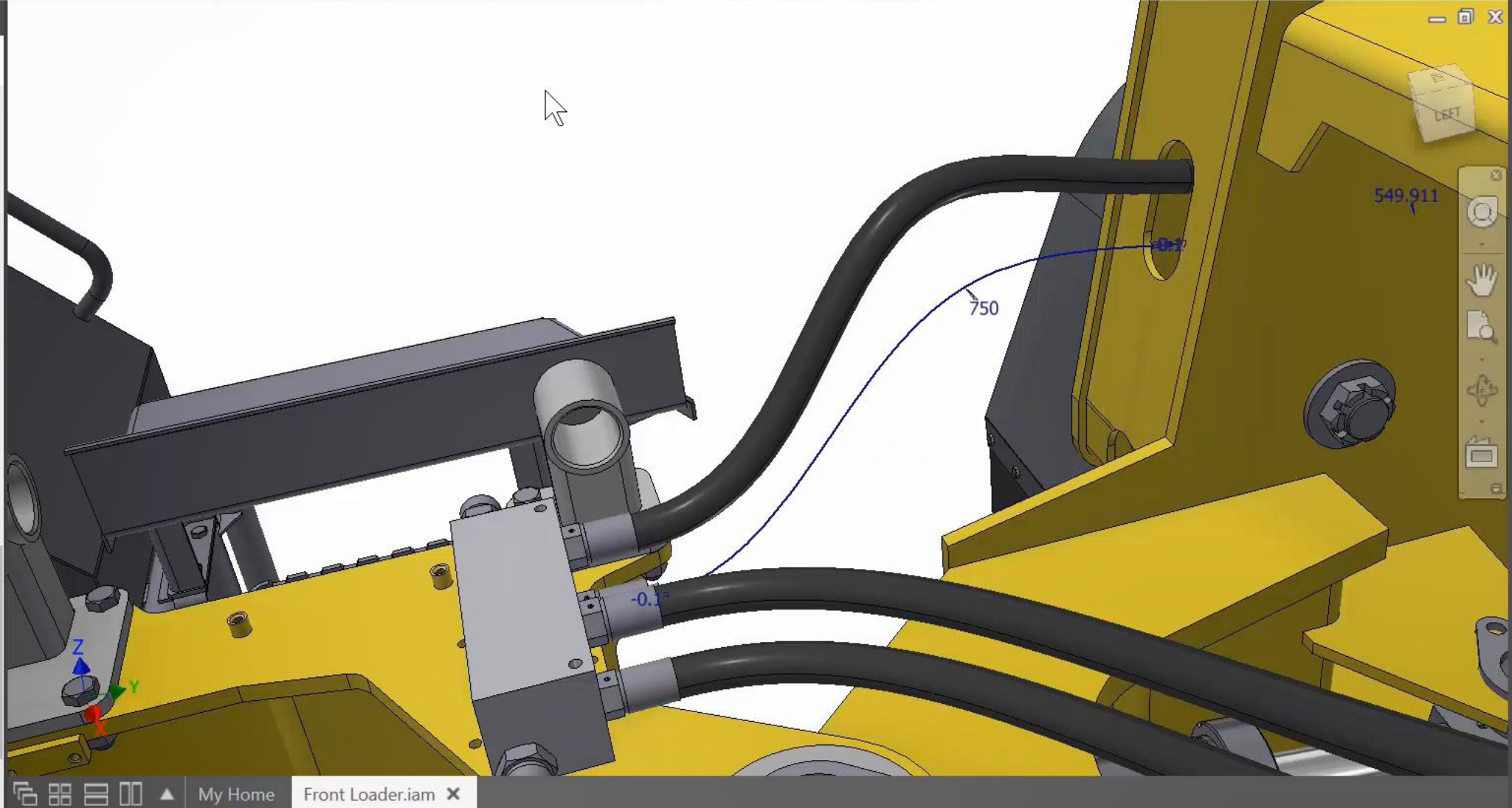
Finish Route

Exit

Model X +

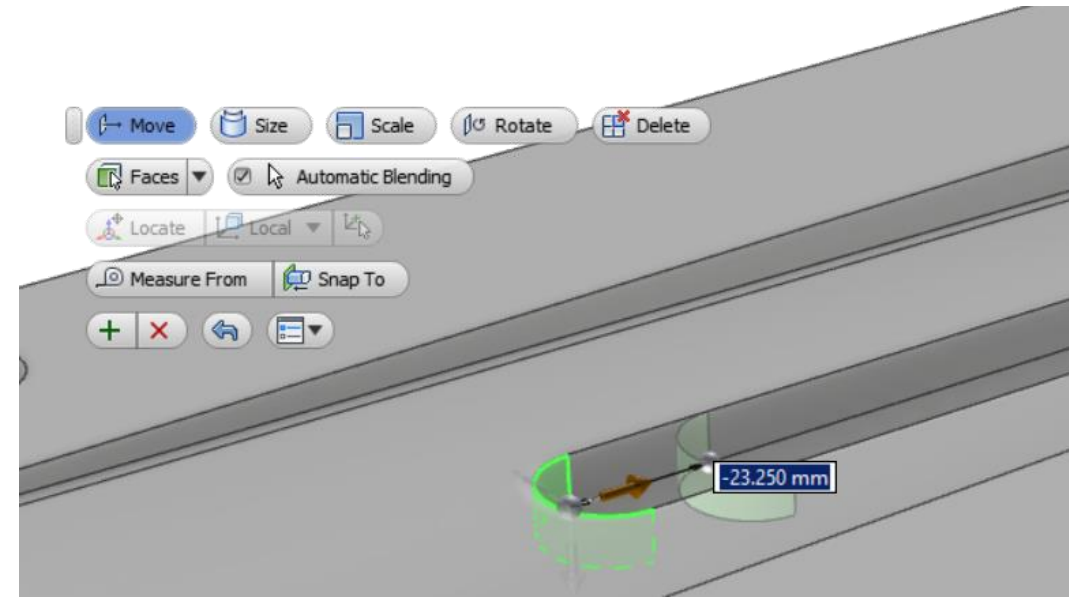
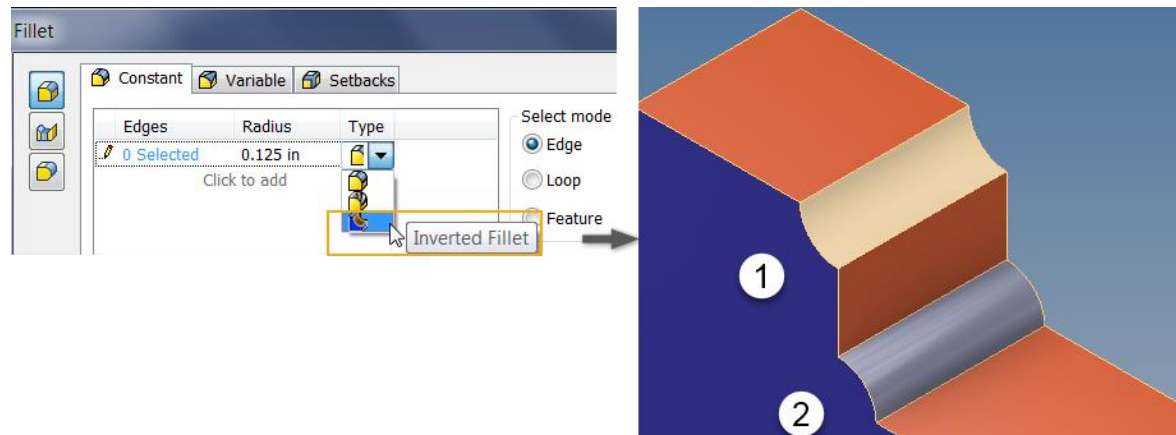
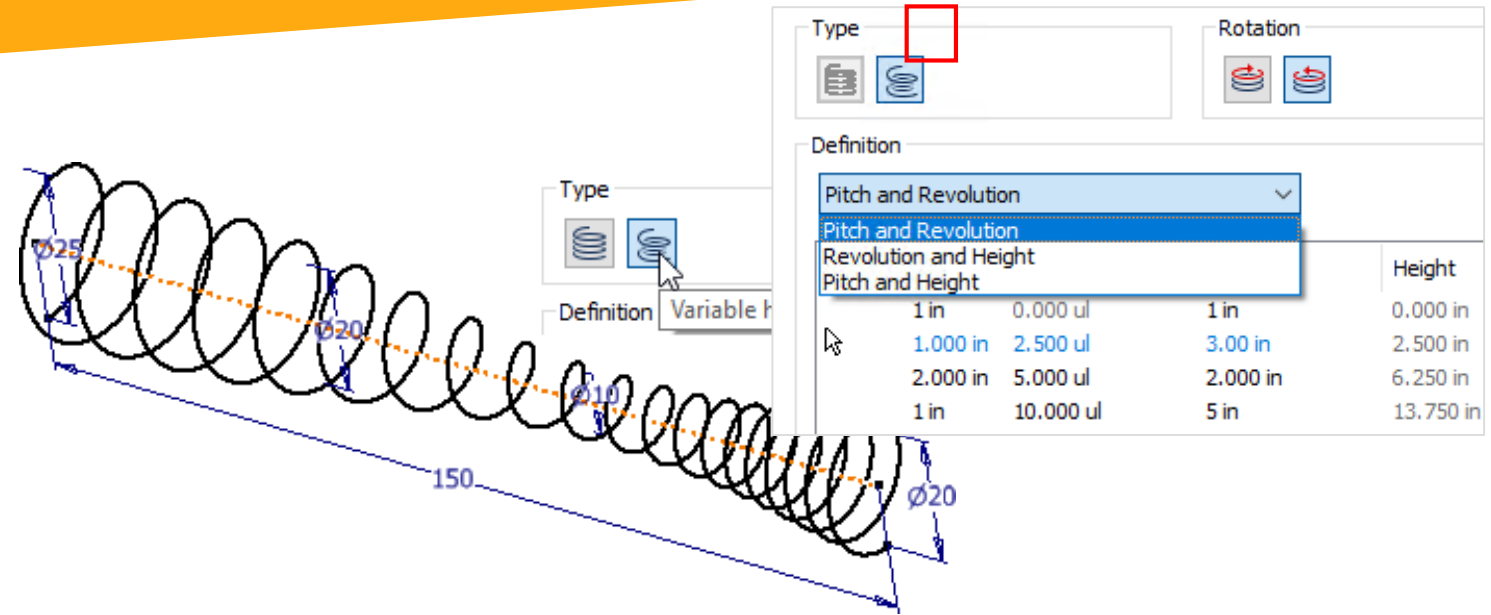
Assembly | Modeling

- Origin
- PK46.30.00.001:1
  - Included Geometry
    - Route Point 1
    - Route Point 3
    - Route Point 2
  - Parker Female Thread - Swivel 1
  - Flexible Hose:1
  - Parker Male Straight Thread 1 x
- PK46.30.00.002:1
  - Relationships
  - Representations
  - Origin
- PK46.30.00.002:1
  - Included Geometry
    - Route Point 1
    - Route Point 3
    - Route Point 2
  - Parker Female Thread - Swivel 1
  - Flexible Hose:1
  - Parker Male Straight Thread 1 x
- PK46.30.00.003:1
- PK46.30.00.004:1



# Inventor Ideas

- ▶ Variable Radial/Helical Curve
- ▶ Inverted Fillet
- ▶ Automatic Blend for Direct Edit

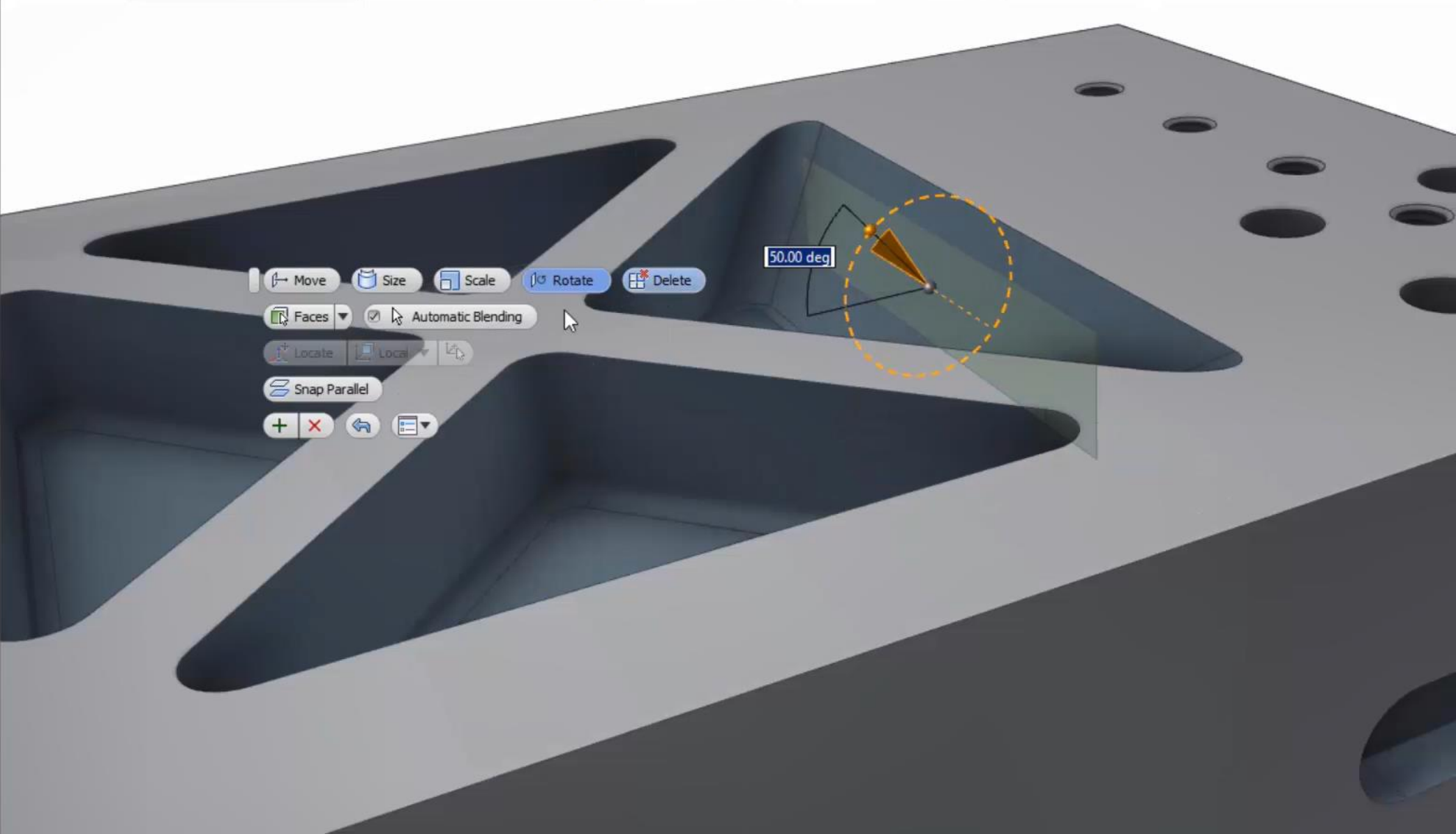


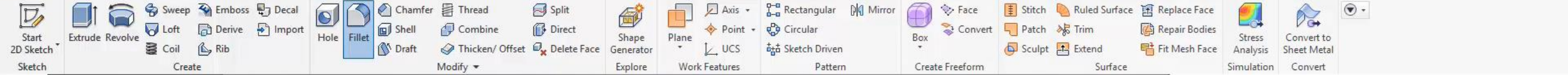
File 3D Model Sketch Annotate Inspect Tools Manage View Environments Get Started Collaborate

Start 2D Sketch Sketch Extrude Revolve Sweep Emboss Decal Loft Derive Import Hole Fillet Chamfer Thread Split Shape Generator Plane Axis Point UCS Rectangular Mirror Box Face Convert Patch Trim Replace Face Repair Body Fit Mesh Face

Coil Rib Create Modify Explore Work Features Pattern Create Freeform Surface

- Model X +
- Circular Pattern1
    - Hole6
    - Hole7
    - Hole8
  - Work Axis1
  - Hole9
  - Hole10
  - Rectangular Pattern1
    - Hole13
    - Hole14
    - Hole15
    - Hole16
    - Hole17
  - Work Axis2
  - Extrusion14
  - Fillet2
  - Hole18
  - Extrusion15
  - Fillet3
  - Hole19
  - Sketch43
  - Sketch44
  - Hole21
  - Hole22
  - Hole23
  - Hole24
  - Hole25
  - Hole26
  - Hole27
  - Hole28
  - Hole29 (Suppressed)
  - Hole30
  - Hole31





- Model > Circular Pattern1
- Hole6
- Hole7
- Hole8
- Work Axis1
- Hole9
- Hole10
- Rectangular Pattern1
- Hole24
- Hole25
- Hole26
- Hole27
- Hole28
- Hole29 (Suppressed)
- Hole30
- Hole31
- Hole32
- Hole33
- Hole34
- Chamfer 1
- Hole35
- Work Plane2
- Hole36
- Delete Face1
- Extrusion17
- Direct Edit1
- Delete Face2

**Fillet**

Constant Variable Setbacks

Edges	Radius	Type
21 Selected	2 mm	

Select mode

Edge

Loop

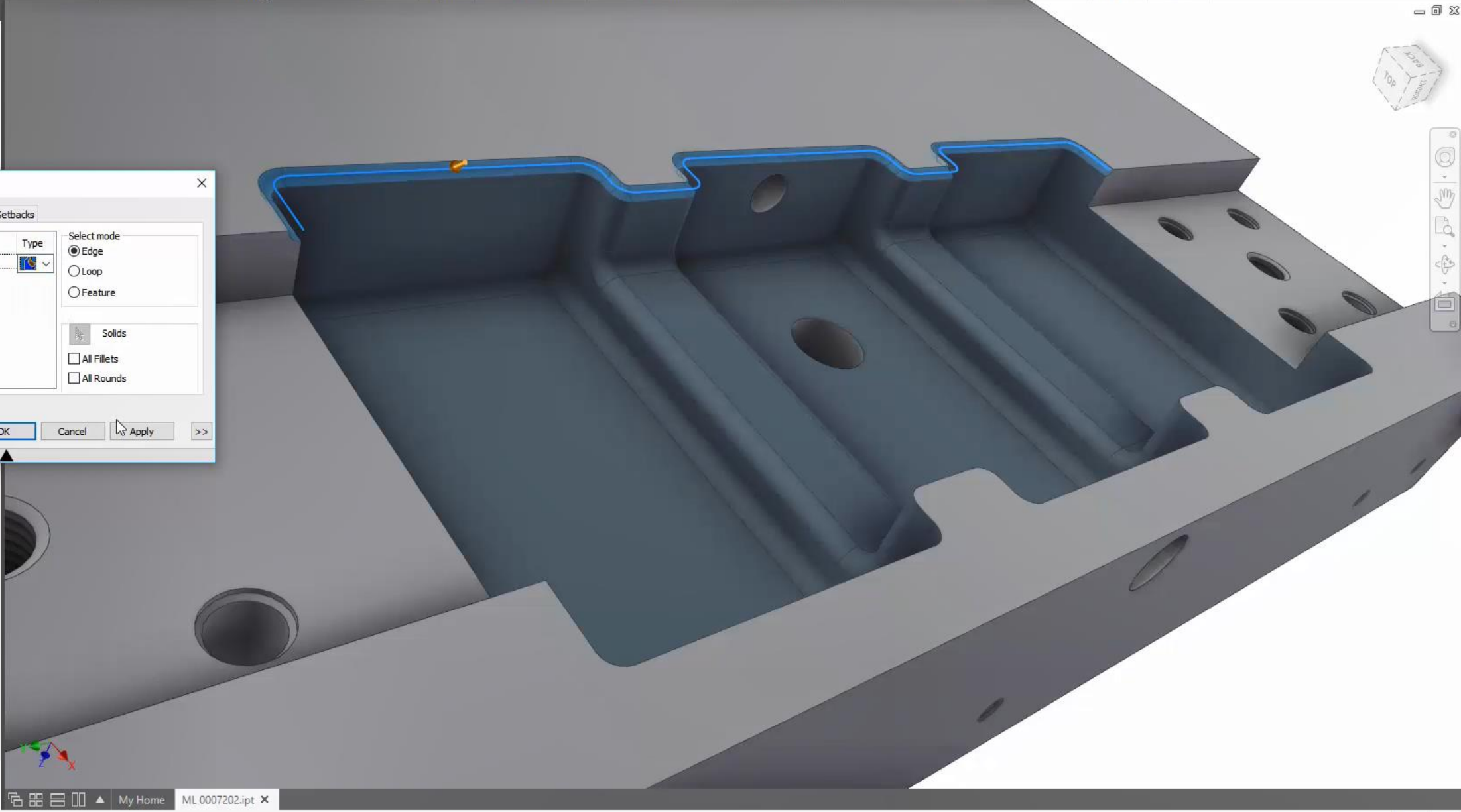
Feature

Solids

All Fillets

All Rounds

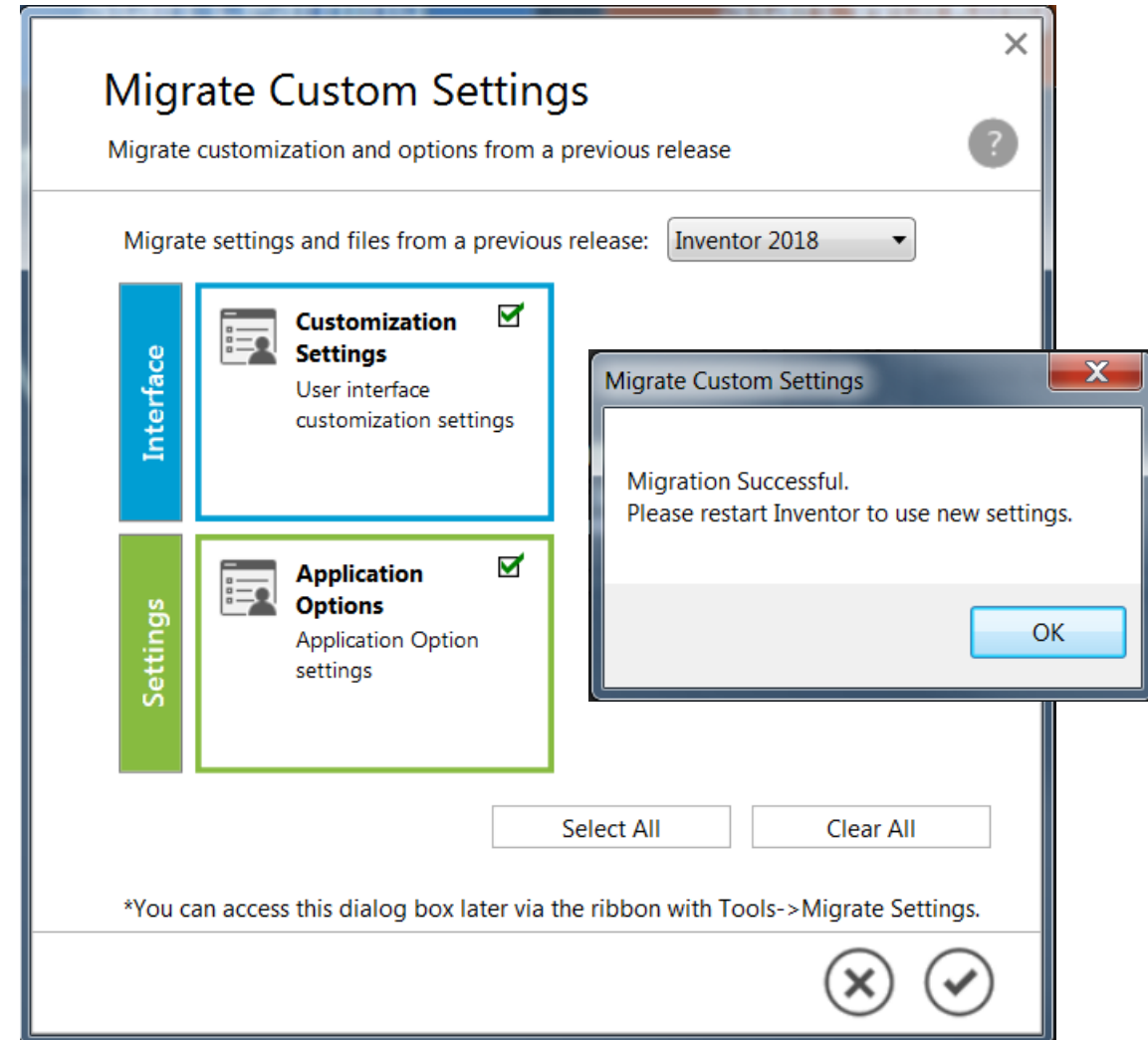
OK Cancel Apply >>





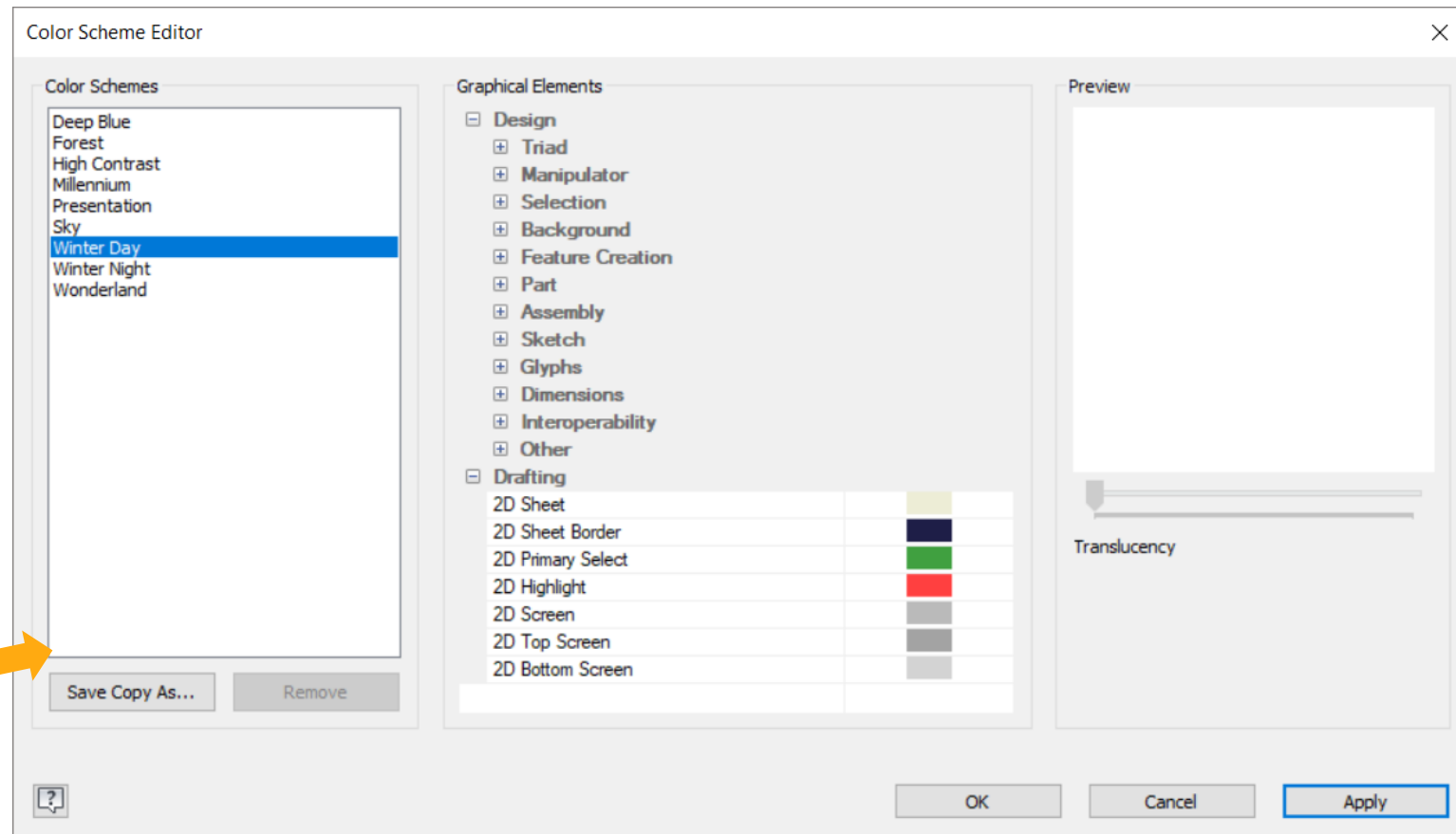
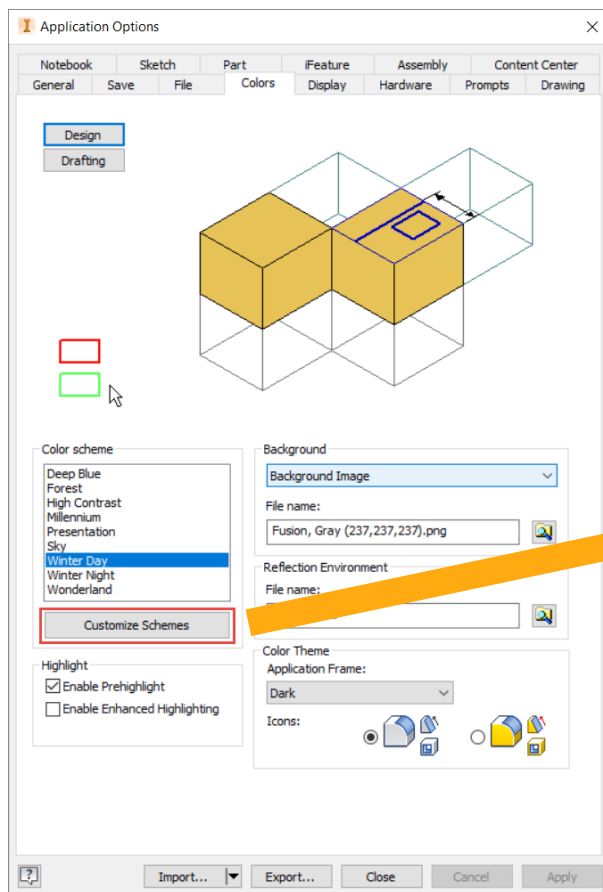
# Migrate Custom Settings Tool

- ▶ Initiated on first run of Inventor 2019
- ▶ Execute on demand later
- ▶ Migrate Customization Settings
- ▶ Migrate Application Options

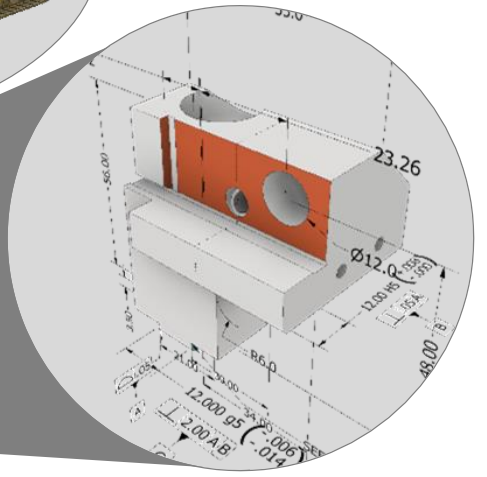


# Color Schema Editor

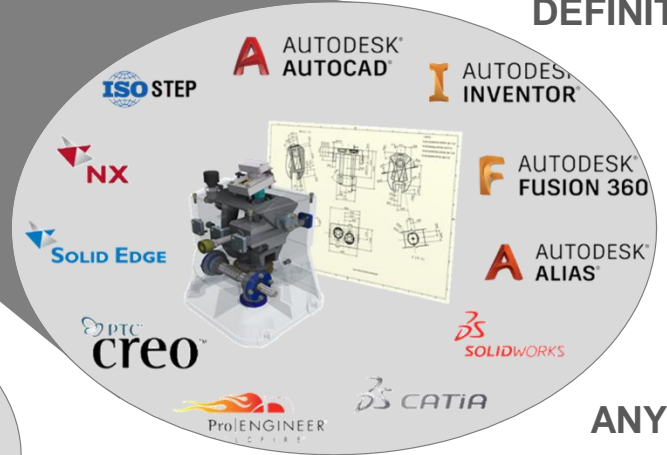
- ▶ Customize and save color schemes for Inventor 2019



**PERFORMANCE  
& AUTOMATION**



**MODEL BASED  
DEFINITION**

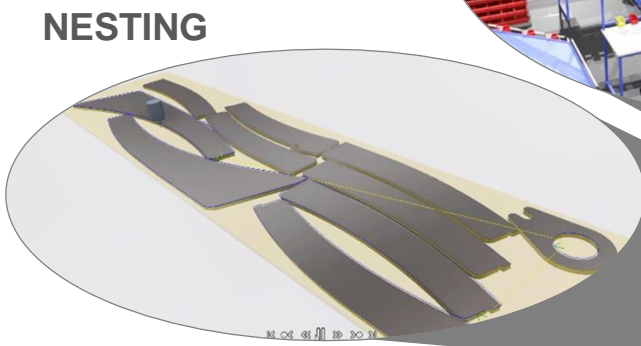


**ANYCAD**

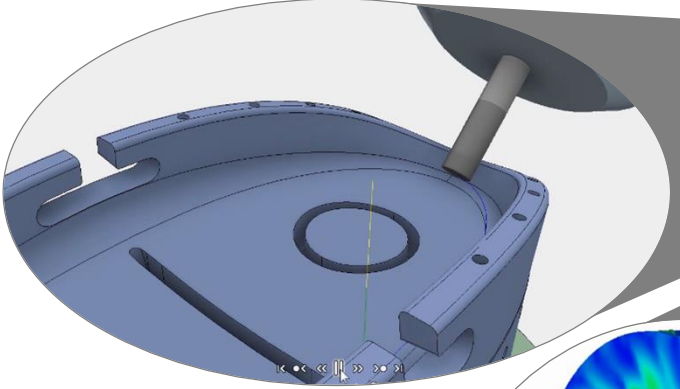
**CLOUD  
COLLABORATION**



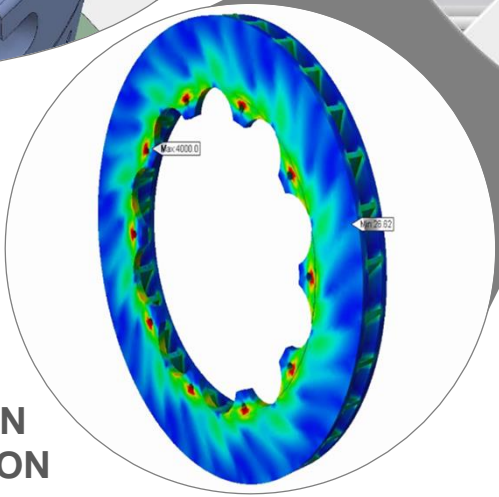
**FACTORY DESIGN  
UTILITY**



**NESTING**



**INTEGRATED  
2.5-5 AXIS CAM**



**NASTRAN  
SIMULATION**



# Industry 4.0

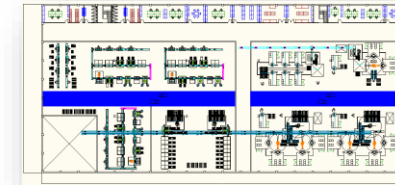
Installation & commissioning



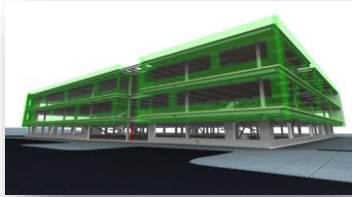
Process simulation



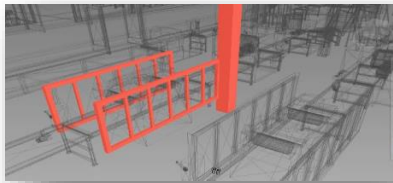
Factory layout



BIM – Building Information  
Modeling



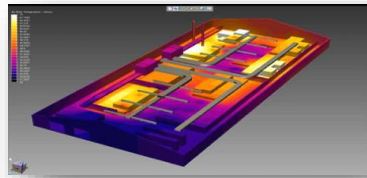
## Autodesk Digital Factory solution



Clash & clearance  
analysis



Multi-CAD / Point cloud  
review



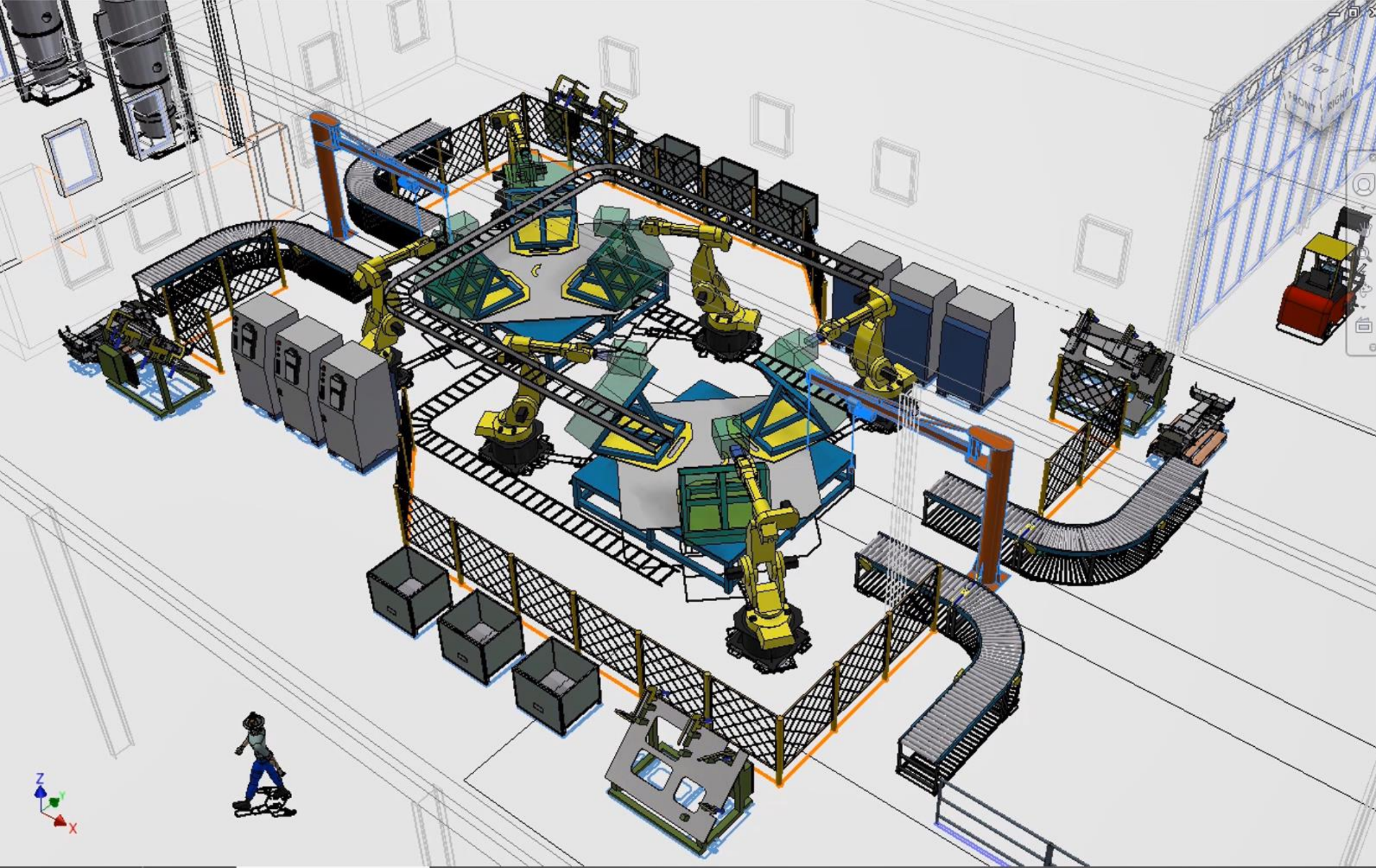
Ventilation / Emission / Energy efficiency  
CFD simulation



Work cell design



Tool & fixture design



jib



Search Results



Jib Crane



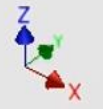
Mini Overhead...



Portable Jib Cr...



Slewing Arm Ji...



Model

Assembly View

Assembly4

- Relationships
- Representations
- Origin
- Connector Links
- End of Features
- electric
- equipment
- human
- office
- robots
- safety equipment
- steel construction
- storage
- transportation

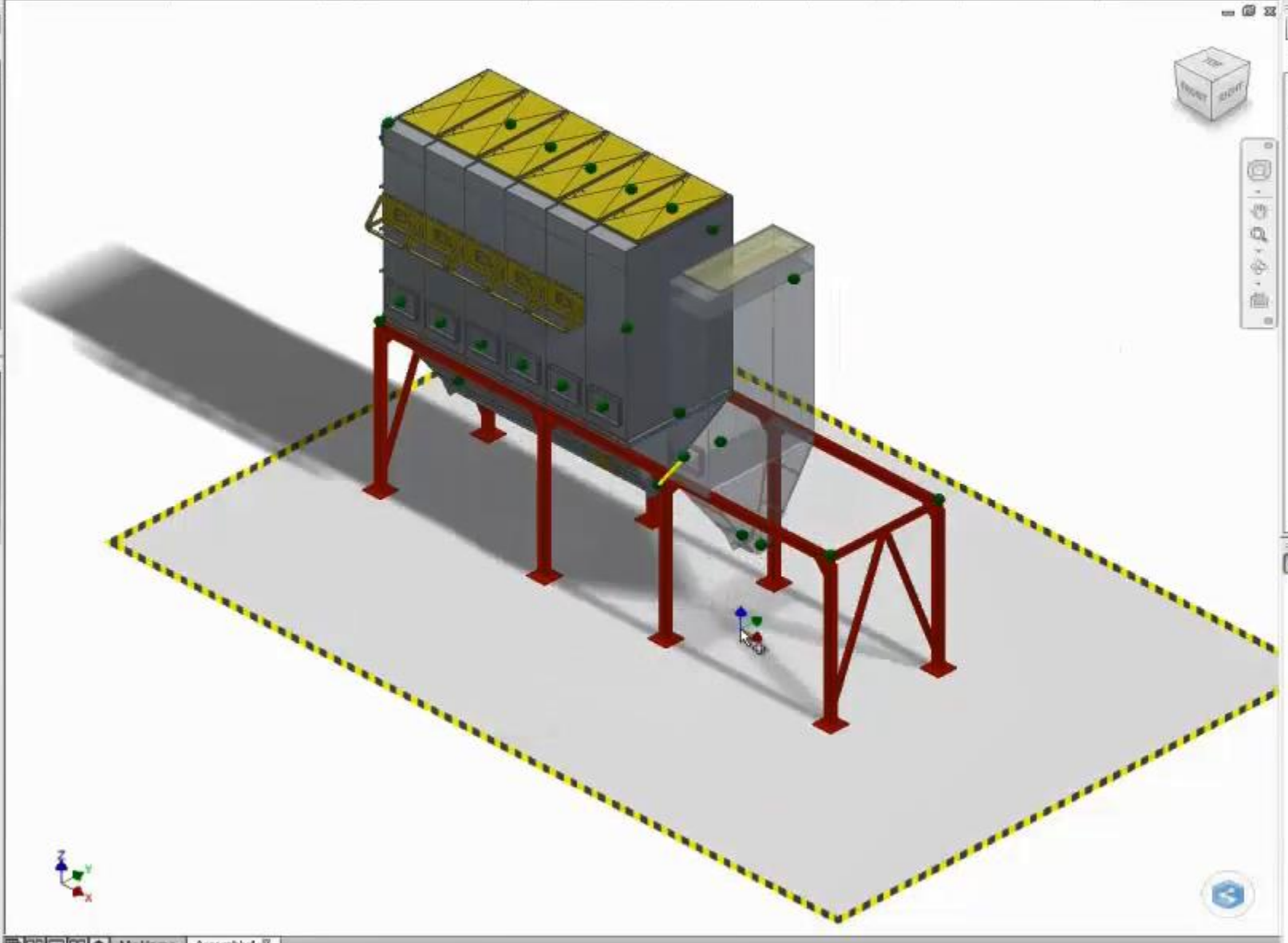


Summary

Title	Filtermodul innen rechts
Author	lutzel

Project

File Subtype	Modeling
Part Number	FDG-00005
Description	filter unit right inside
Revision Number	-
Designer	lutzel
Create Date	11.03.2015



System Assets

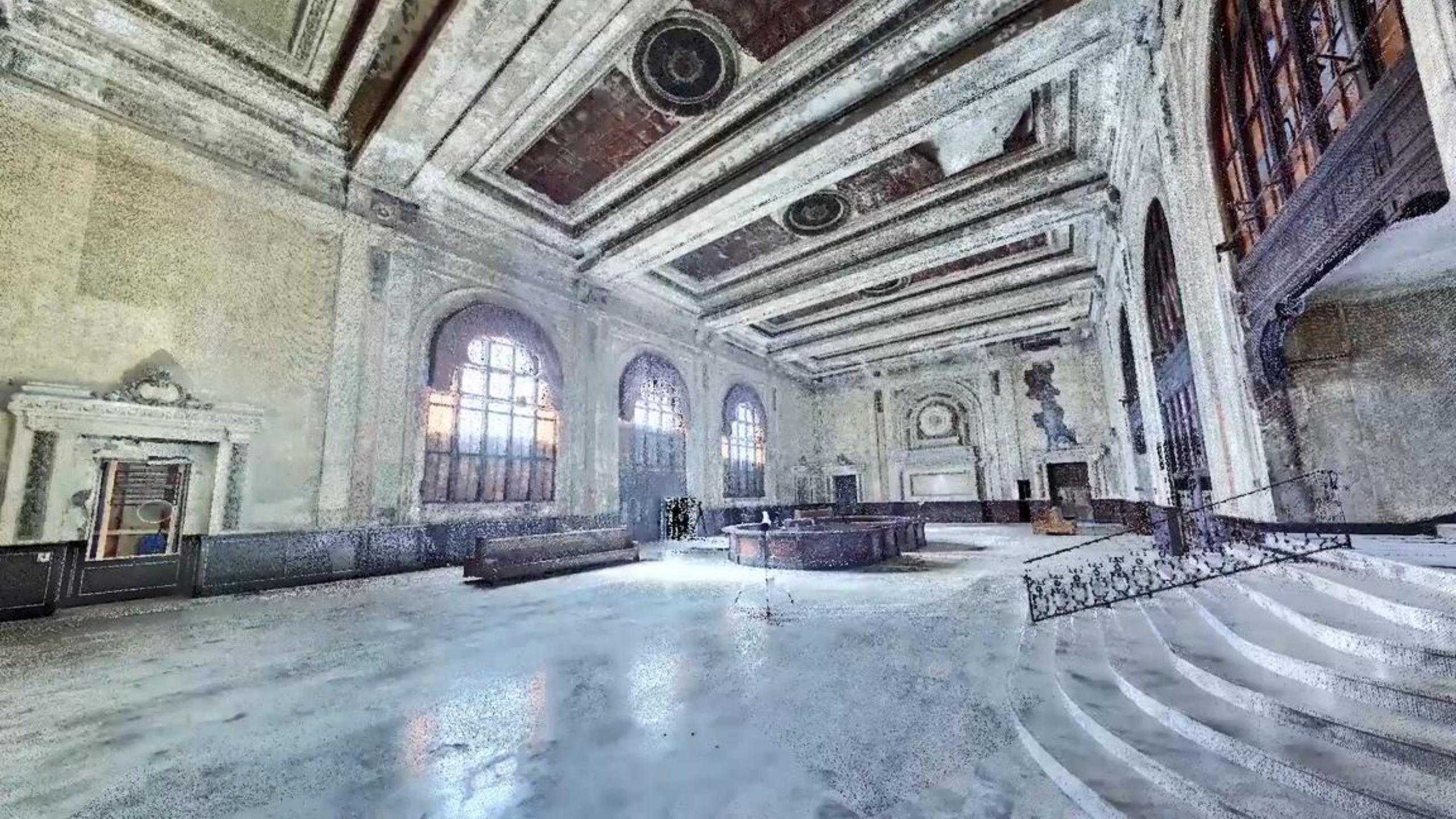
User Assets

Libraries

MyAssets

- Filteranlage
  - Filter
    - Antrieb
    - Filtermodul aussen links
    - Filtermodul aussen rechts
    - Filtermodul innen links
    - Filtermodul innen rechts
    - Filtermodul Mitte
    - Filtermodul Mitte mit Tur
    - Geländer
    - Geländer-Bühnenverlängerung
    - IPE-Unterstützung
    - Schalldämmkammer
    - Werbetafel 2000 x 1000
  - Kanäle
  - Sicherheitseinrichtungen
  - Ventilatoren
  - Werbetafel 2000 x 1000

User Cloud Assets







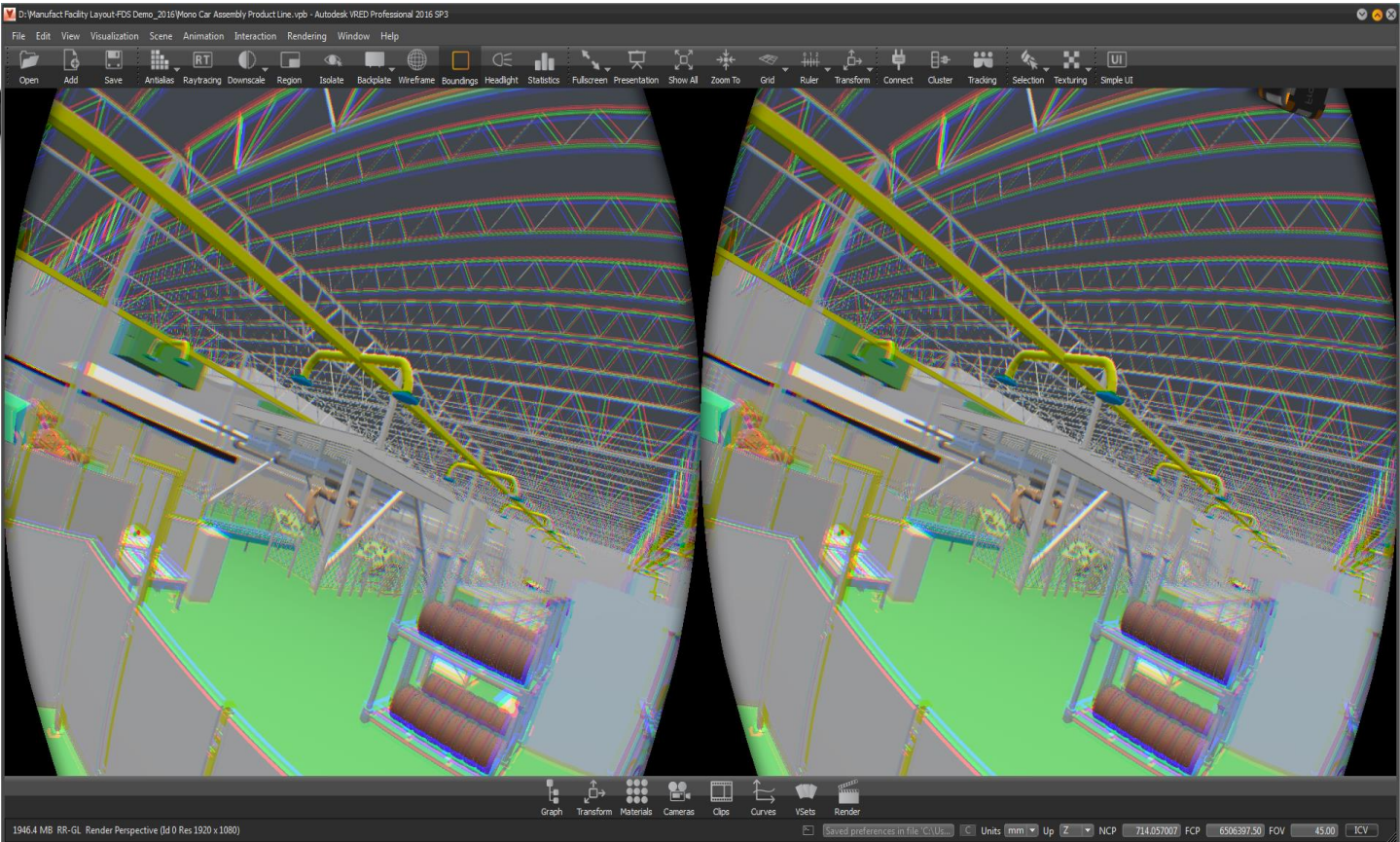


GET IMMERSIVE USING

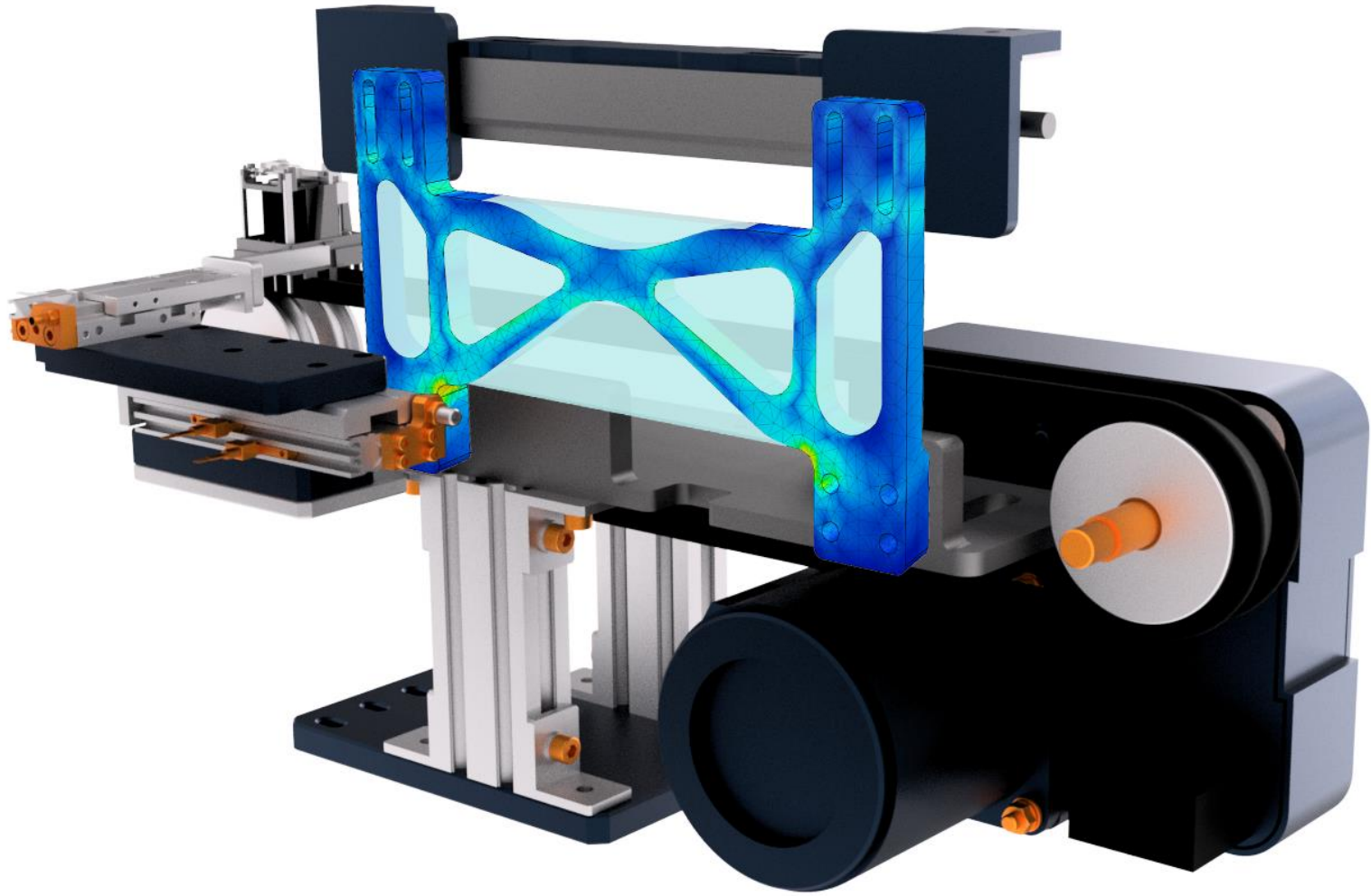
Google Cardboard,  
Oculus Rift,  
or Gear VR

[Learn more >](#)



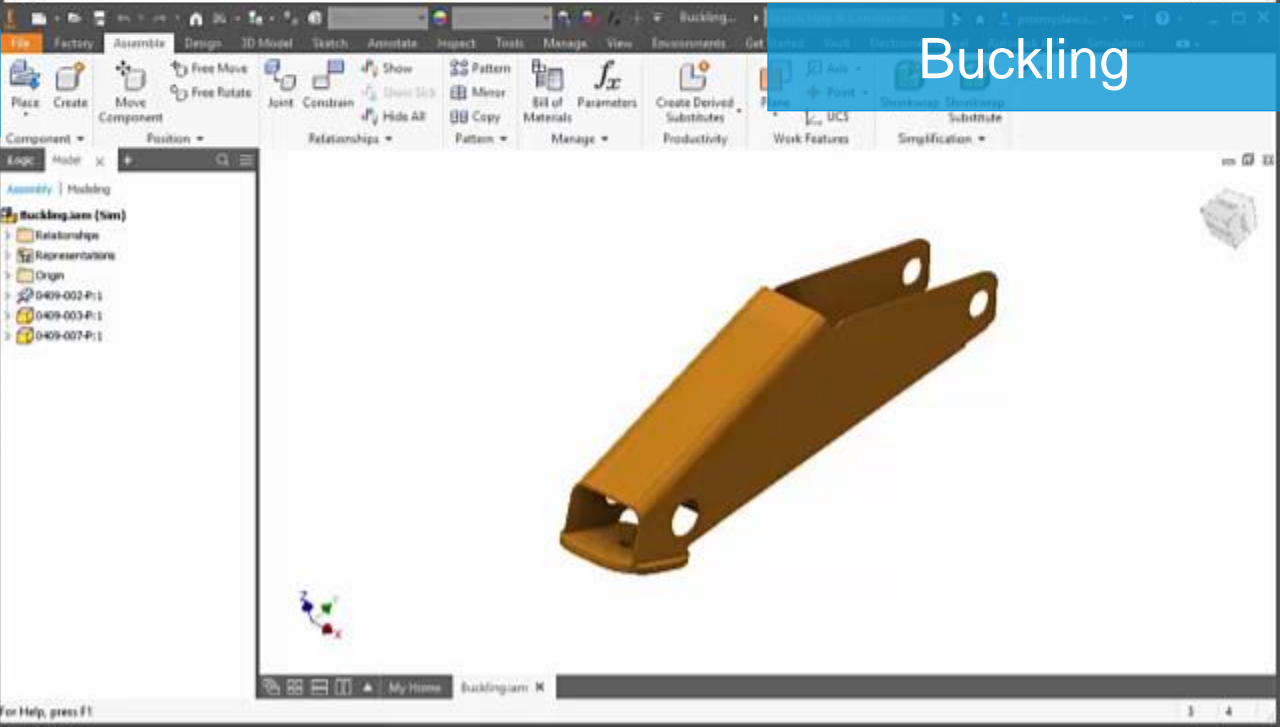
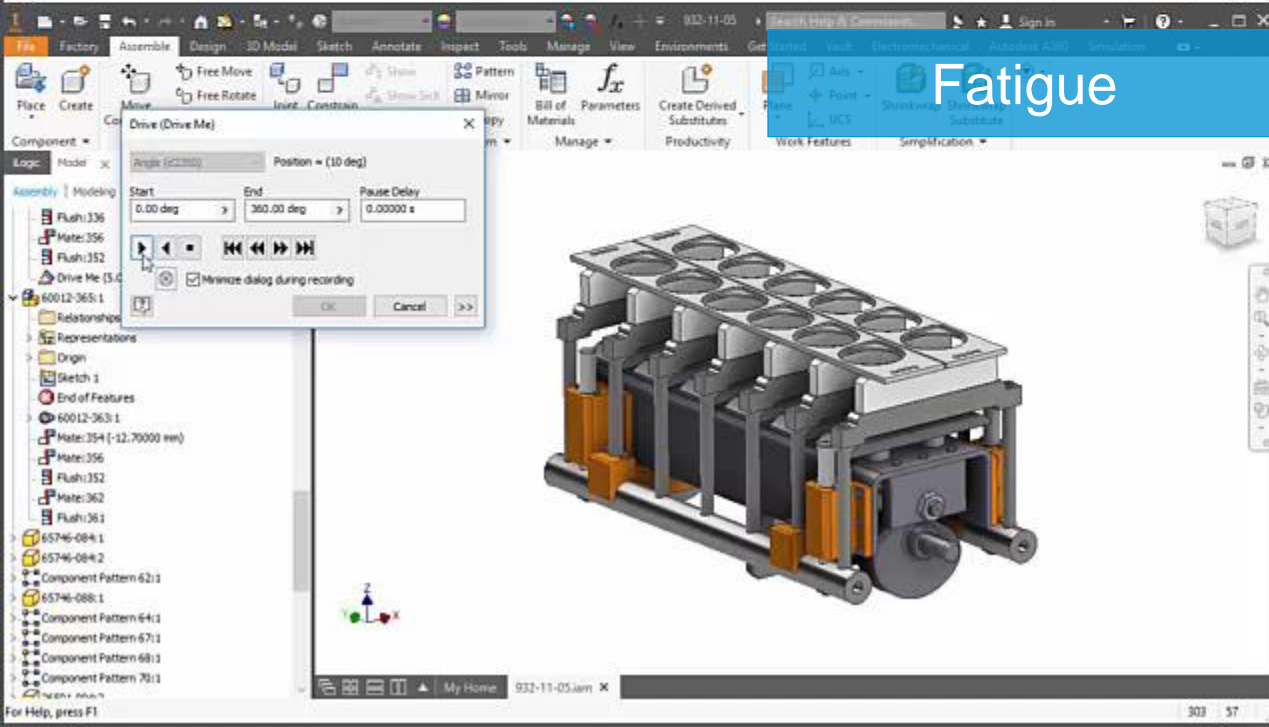
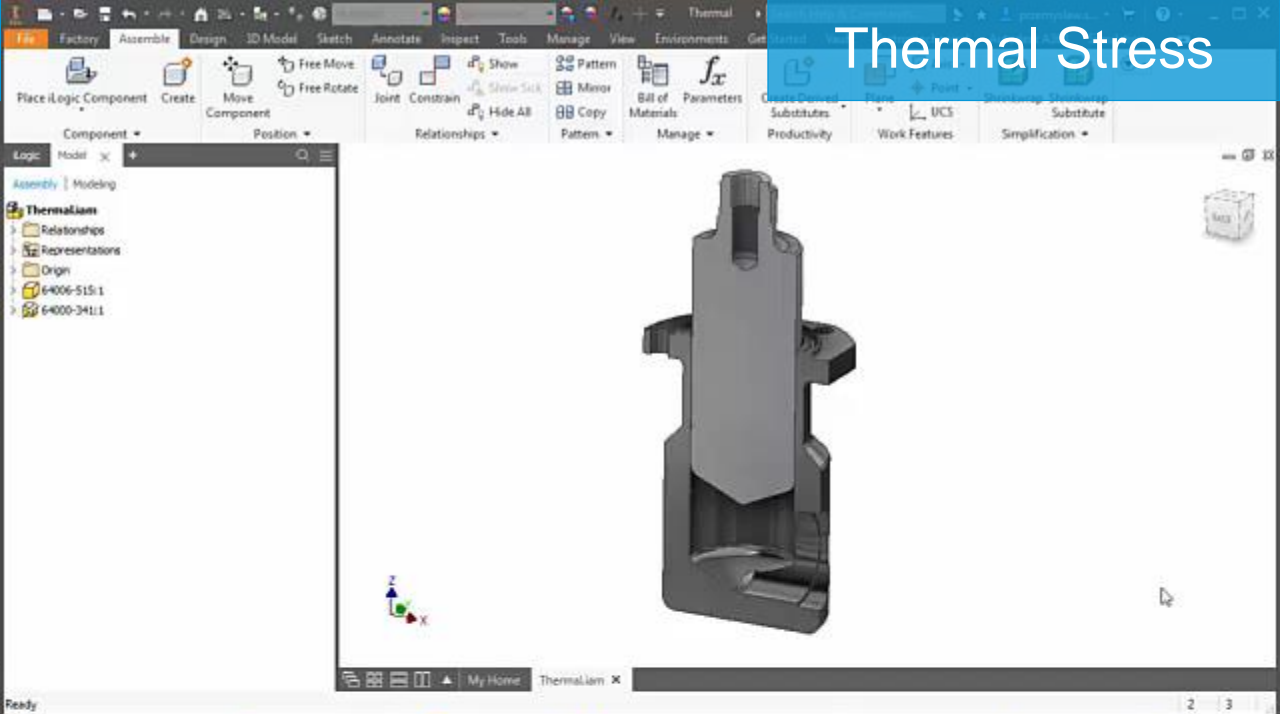
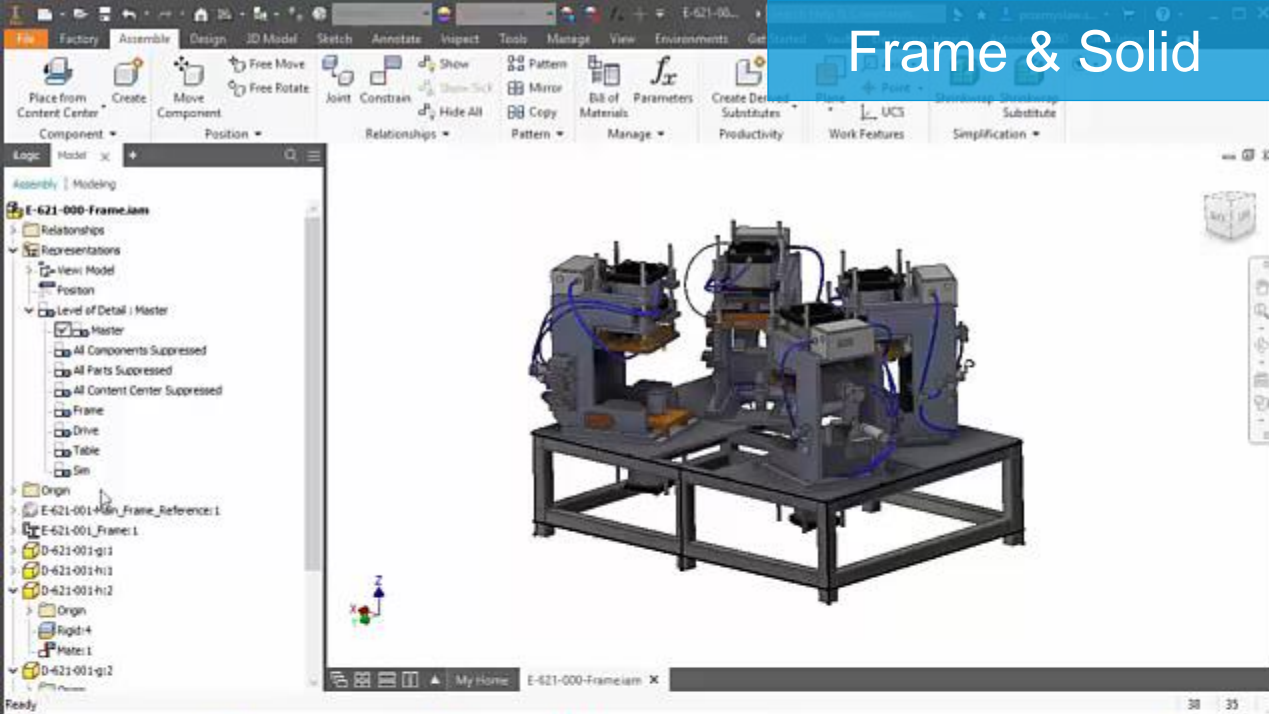


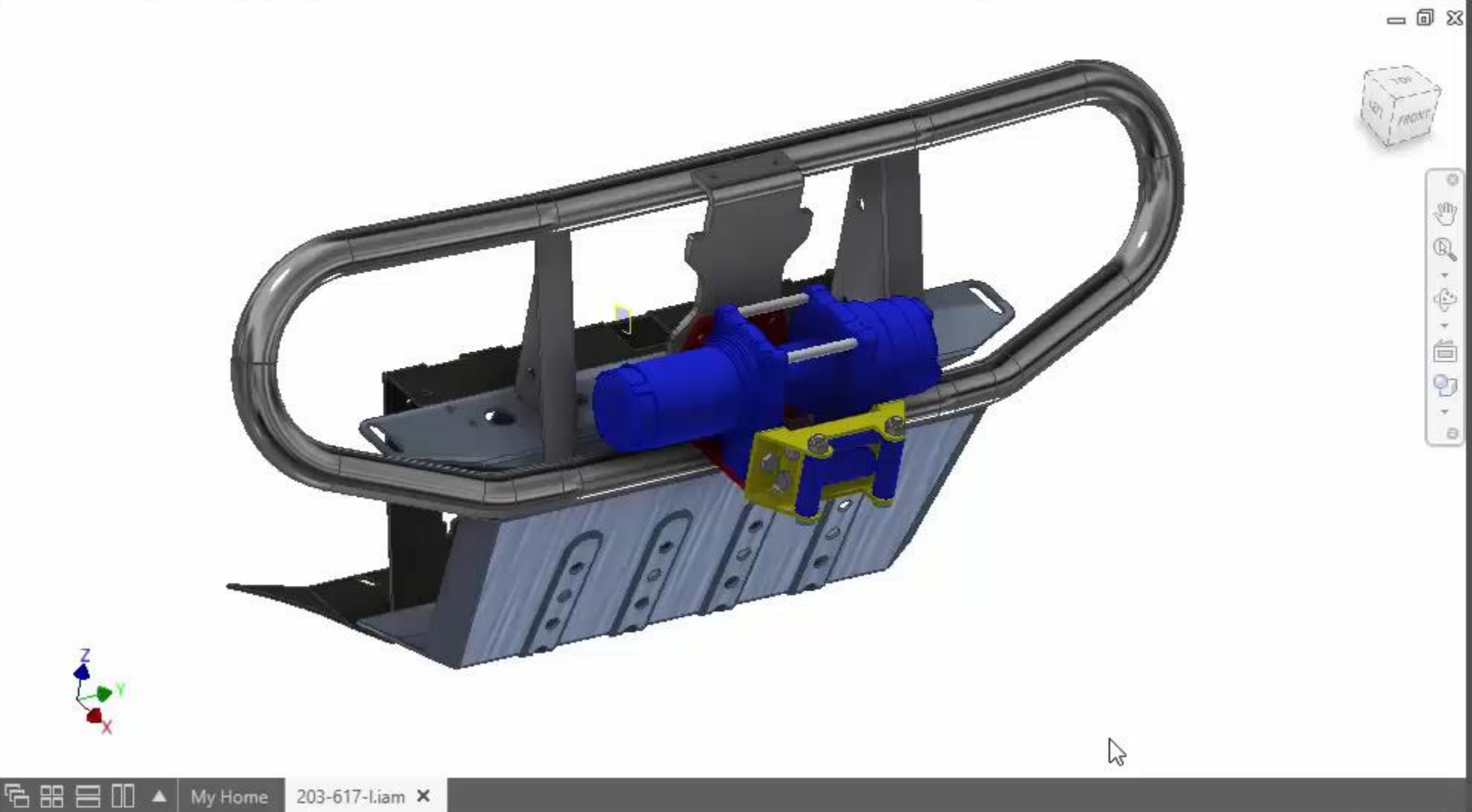
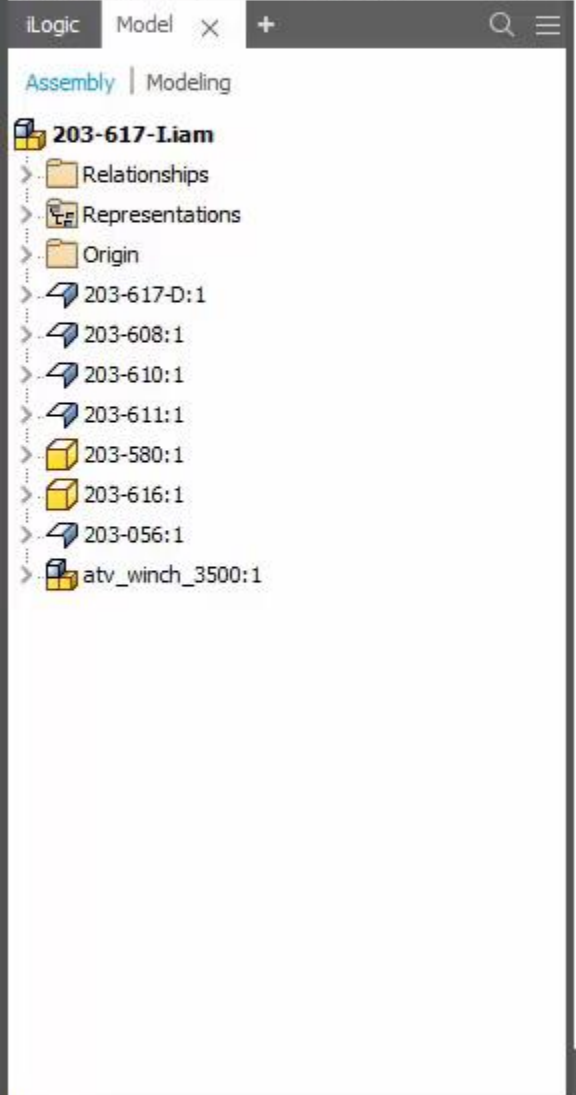
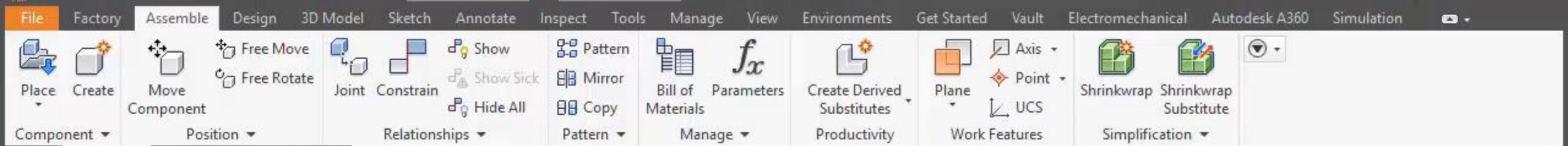


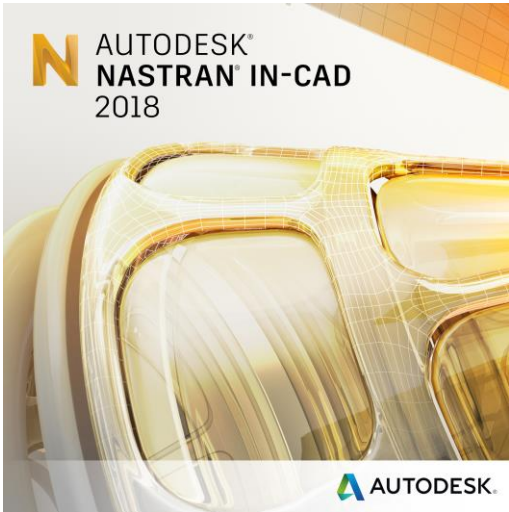


**N** AUTODESK®  
**NASTRAN®** IN-CAD  
2018

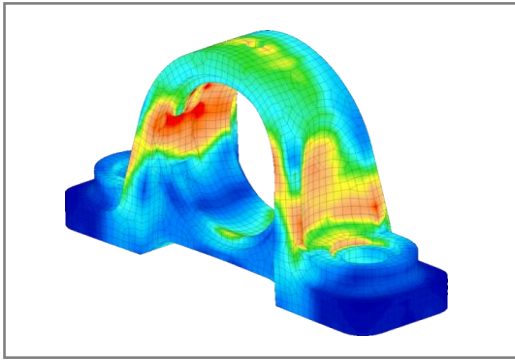




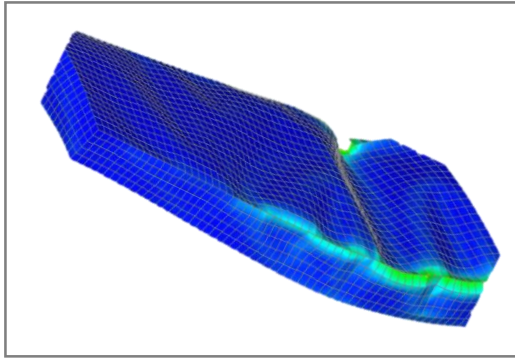




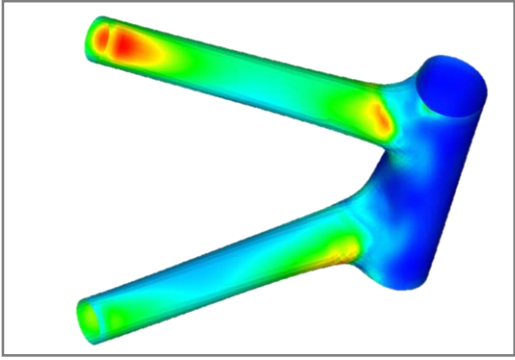
Linear Statics



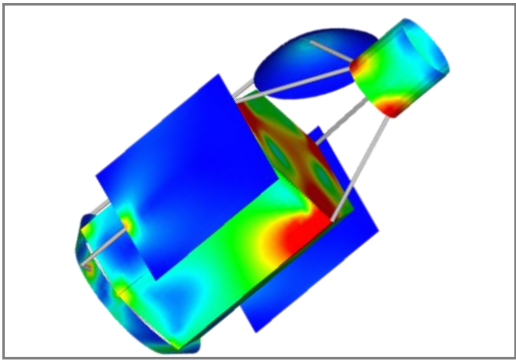
Buckling



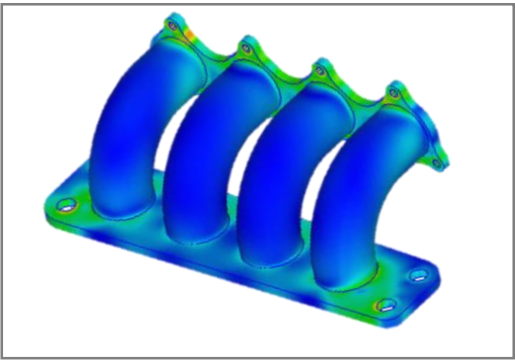
Fatigue



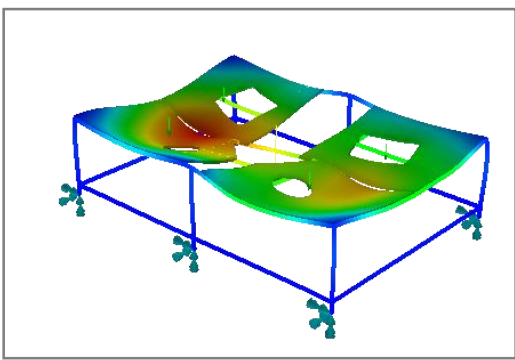
Direct Transient Response



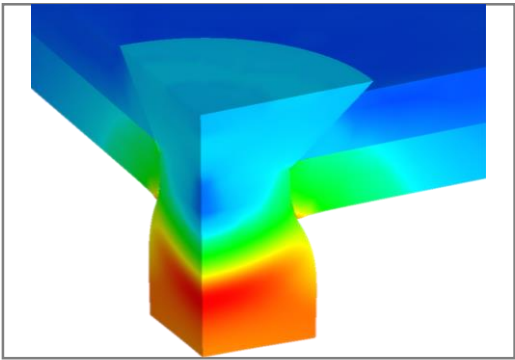
Thermal Stress



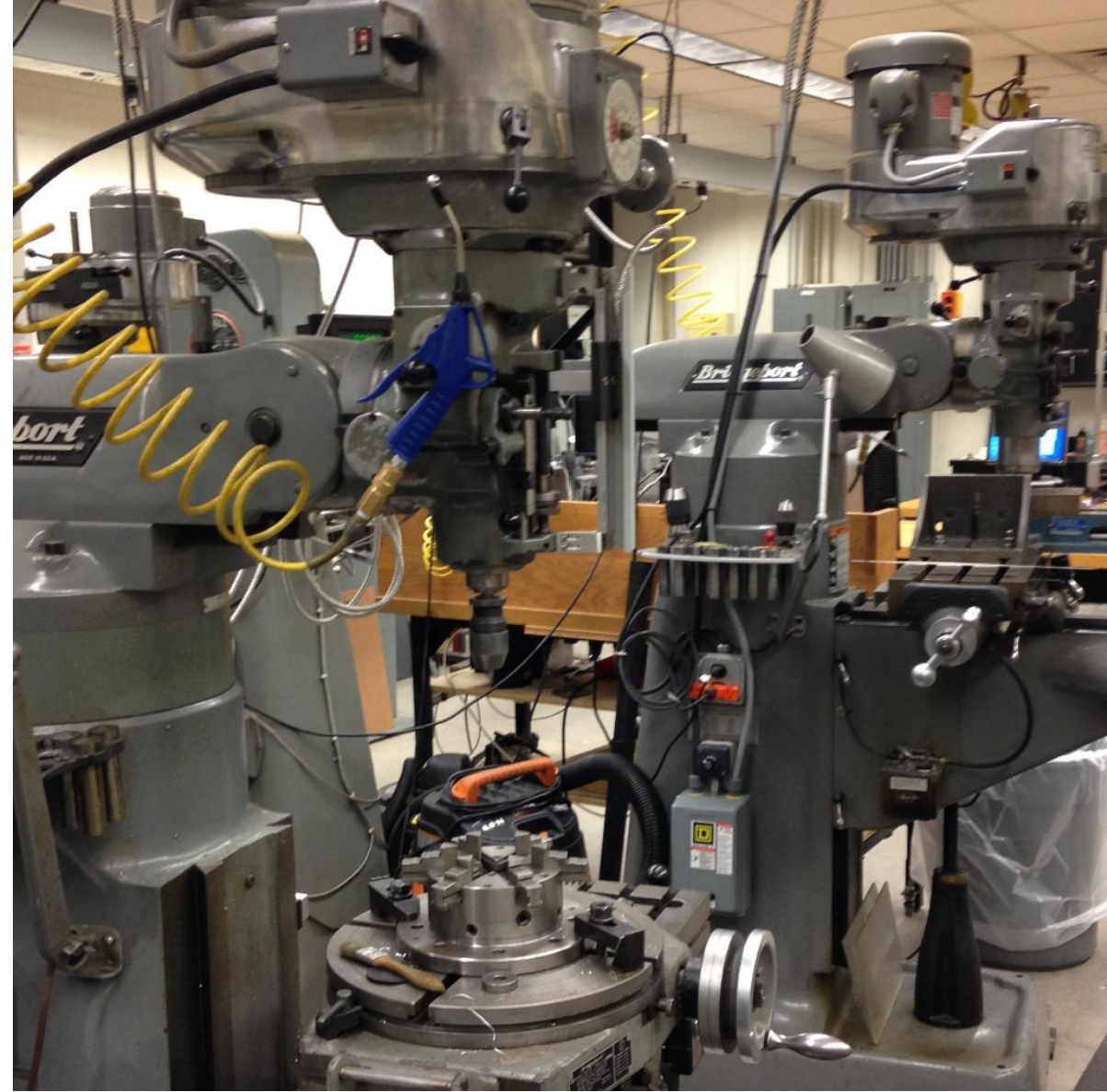
Frame Analysis



Nonlinear Statics



# DESIGN



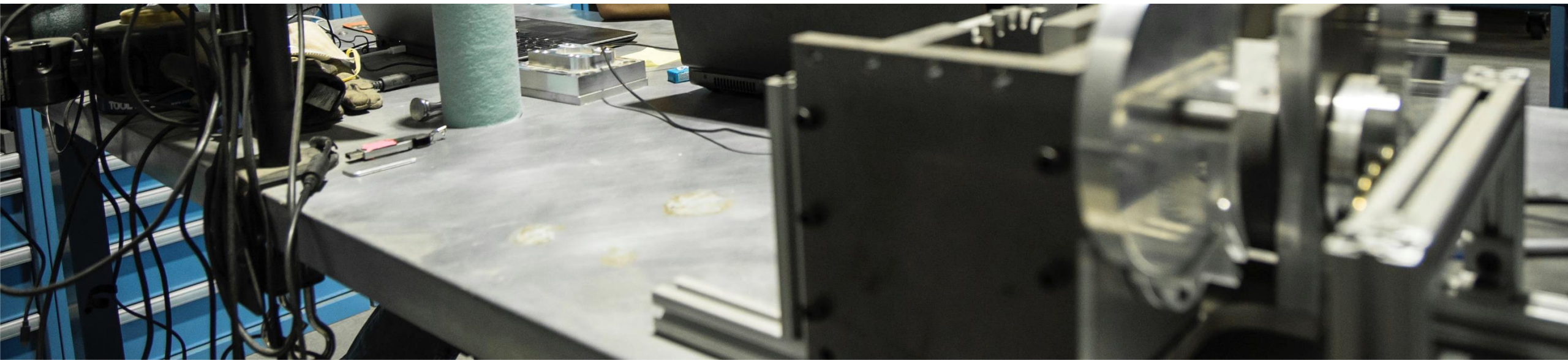
# MAKE







# DESIGN & MAKE



Simulate Post Process Setup Sheet Generate Setup Folder Pattern Manual NC WCS Probe Drill Face 2D Adaptive 2D Pocket 2D Contour Adaptive Horizontal Contour Parallel Swarf Multi-Axis Contour Profile Groove Face Part Thread Tool Front Tool Right Tool Top Tool Library Task Manager Options Manage Help/Tutorials Help

Model CAM x +

Simulation

Display Info Statistics

Tool

- Show shaft
- Show holder
- Show transparent

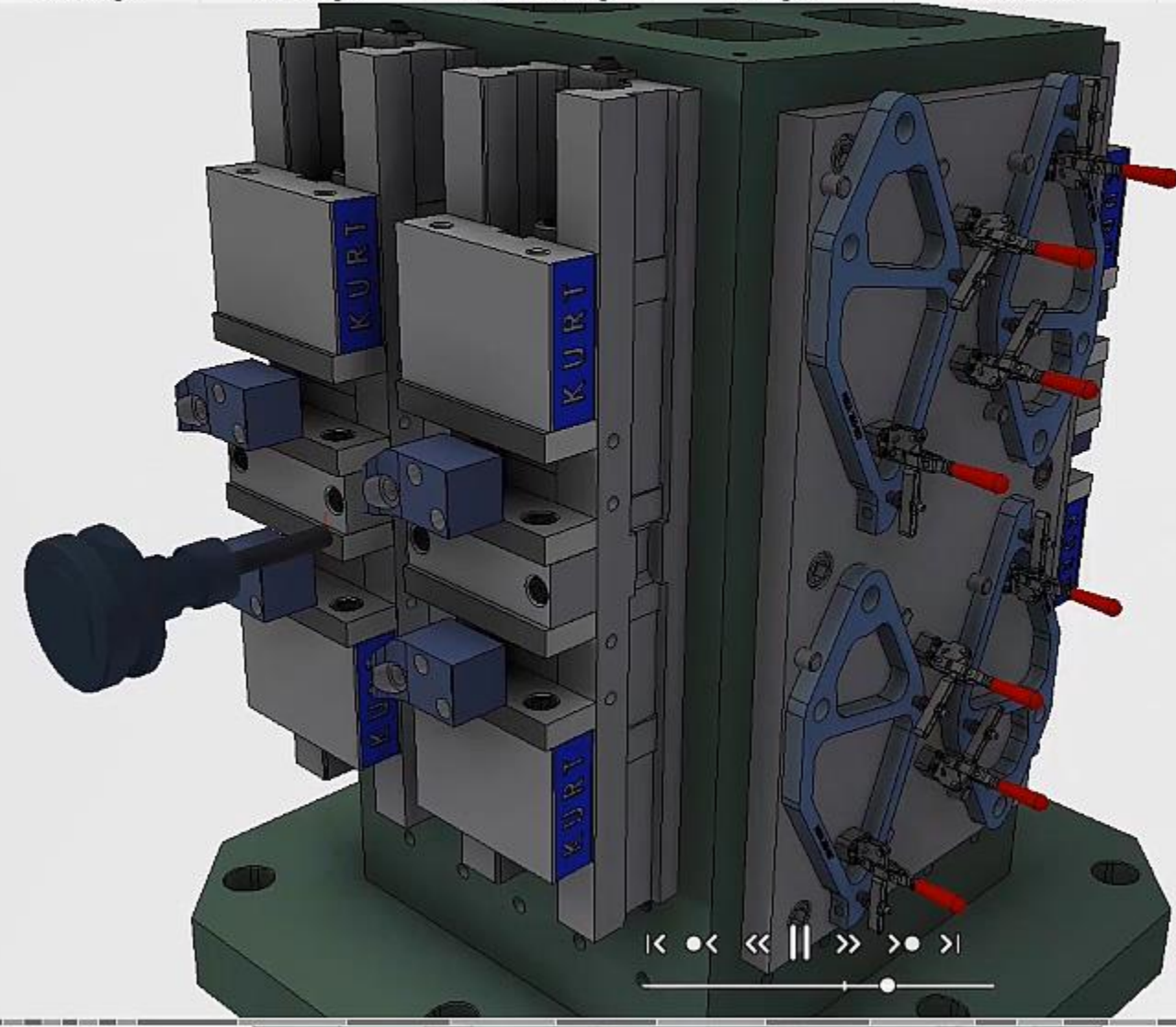
Toolpath

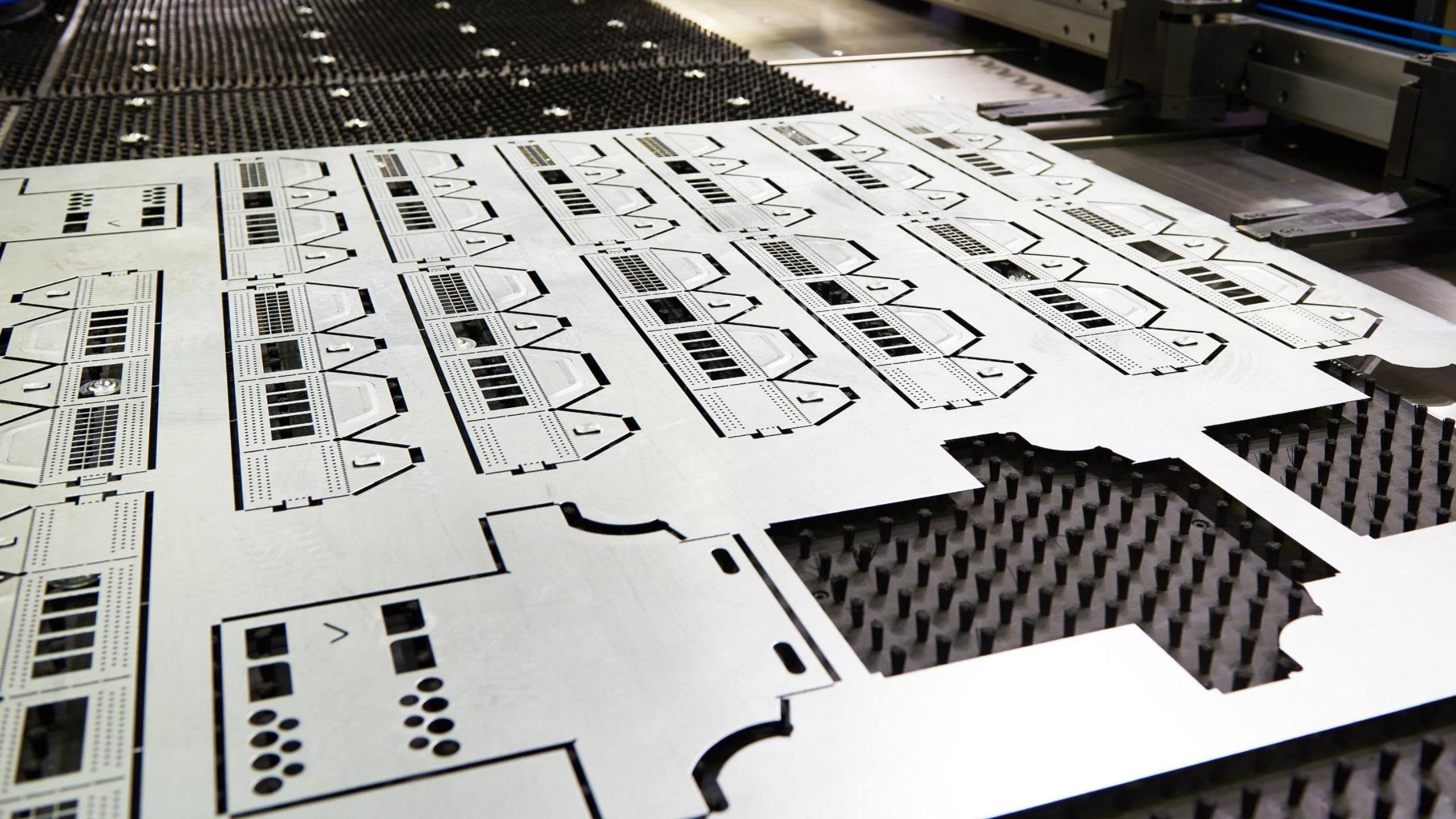
- Show points
- Show axes

Toolpath mode:

Tail

Stock





File 3D Model Sketch Annotate Inspect Tools CAM Manage View Environments Get Started Autodesk A360

Simulate Post Process Setup Sheet Generate Toolpath Job Pattern Manual NC Probe Drill Face 2D Adaptive 2D Pocket 2D Contour Adaptive Horizontal Contour Parallel Swarf Multi-Axis Contour Profile Groove Part Thread 2D Profile Tool Isometric Tool Front Tool Right Tool Top Tool Library Task Manager Options Manage Help/Tutorials Help

Model CAM x +

Simulation

Display Info Statistics

Tool

- Show shaft
- Show holder
- Show transparent

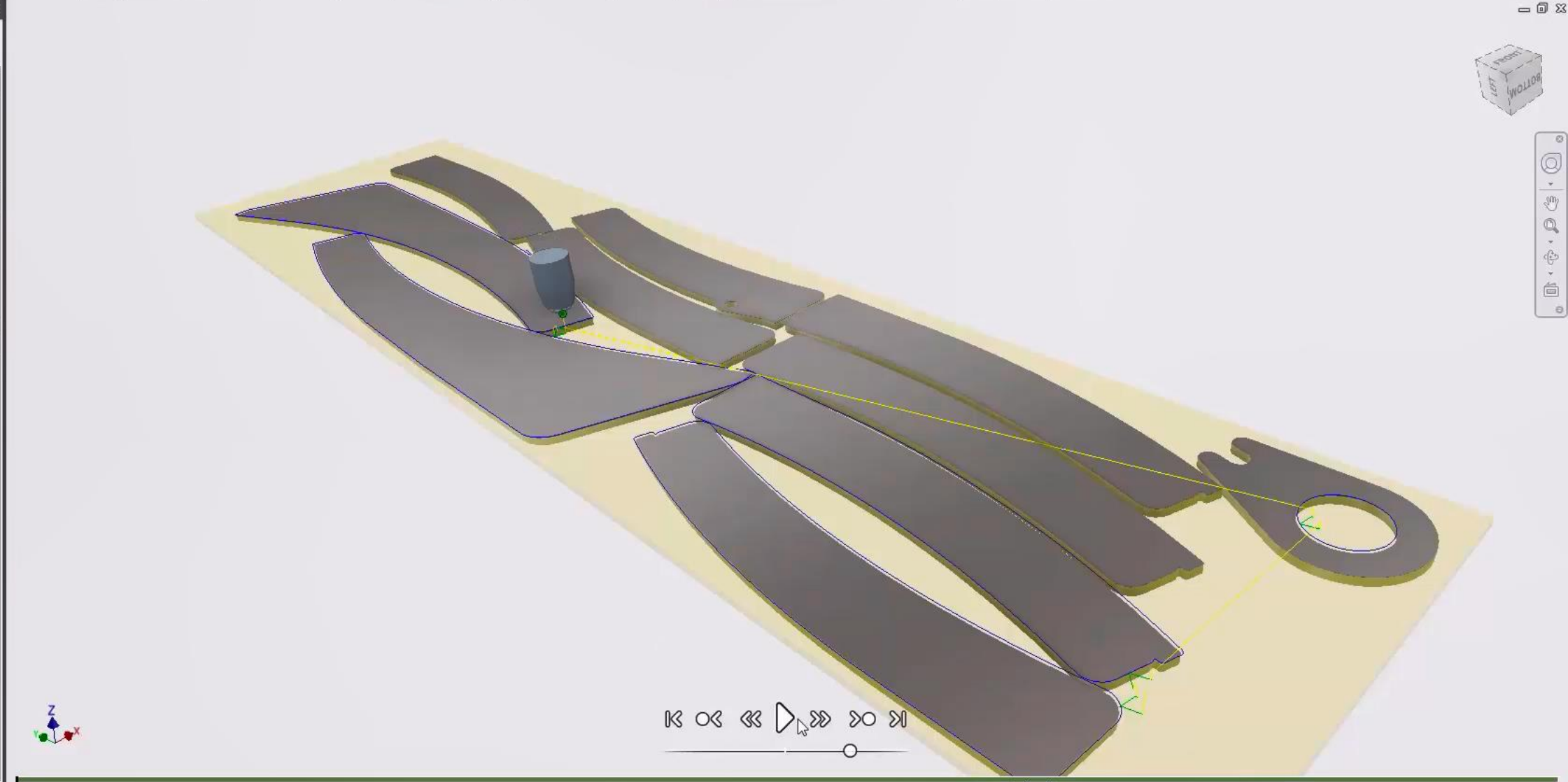
Toolpath

- Show points
- Show axes

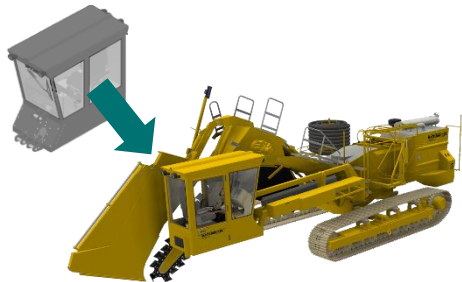
Toolpath mode:

All toolpath

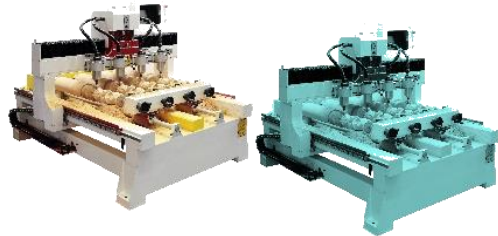
Stock



## PRODUCTIVITY



Design Experience

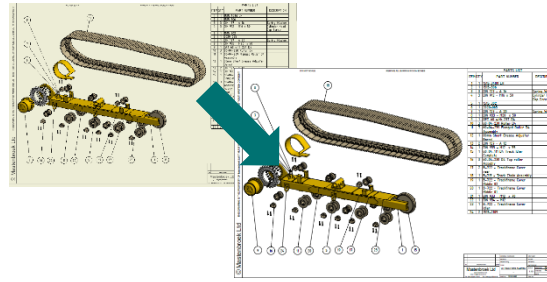


Design Re-Use



Factory Design

## AUTOMATION



Publish & Manage PDF

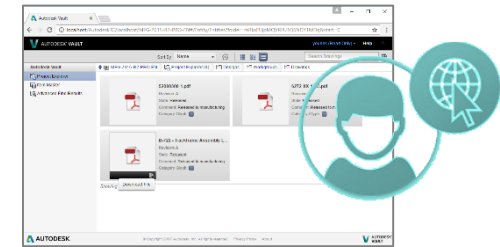


Task Automation



Flexible Security Model

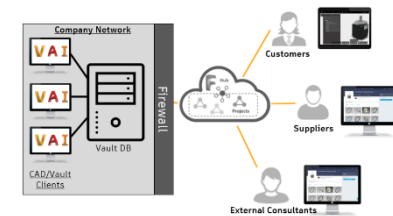
## COLLABORATION



Web Client



Shared Views



Design Collaboration

# Shared Data



Home

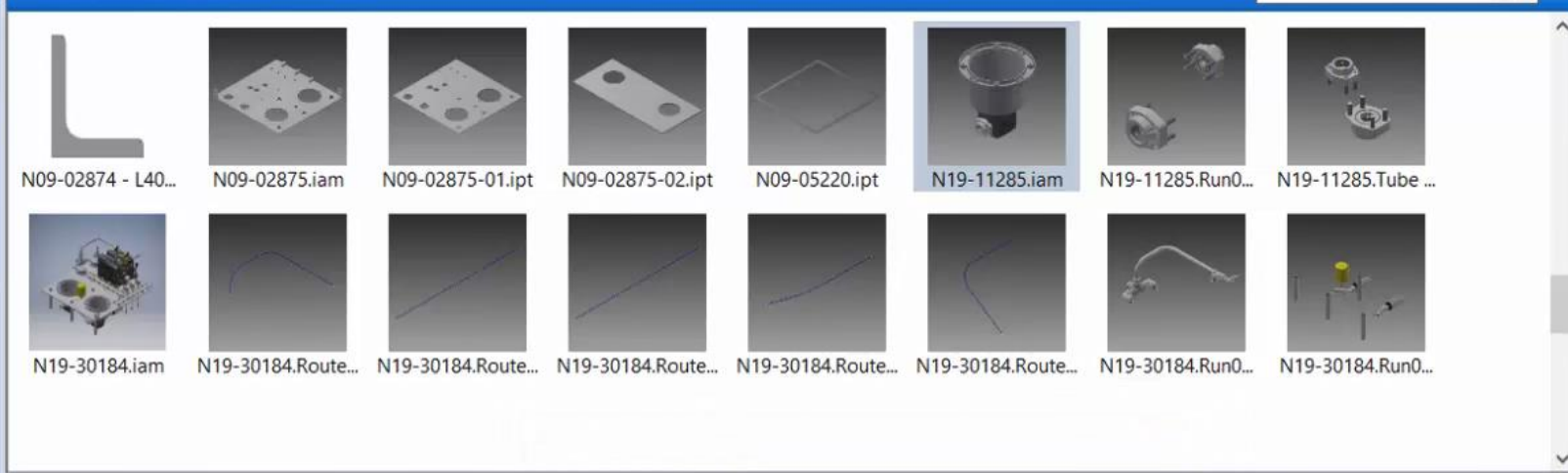
- Item & BOM
- Konstruktion
  - AnyCAD-001
  - AnyCAD-002
  - AnyCAD-011
  - AutoCAD Plansätze
  - Datenimport
  - Diverse
  - Factory Asset Library
  - Factory Asset Library Source
  - Factory Assets
  - Innenausbau
  - MJ
  - Osgood
  - P-00000
  - P-00003
  - P-00008
  - P-00012
  - P-00014
  - P-00020
  - P-00022
  - P-00023
  - P-00024
  - P-00025
  - P-00026
  - Parker
    - Inventor Files
    - SR-0001

- My Worklist
- ECO-000019 (10.04.2016)
  - ECO-000020 (11.04.2016)

- My Shortcuts
- Vane Pump
  - Arm System\_Finish.iam
  - N19-30184.iam

- Home
- Project Explorer
- Claim

Inventor Files



History Uses Where Used Change Order Preview CAD BOM Datasheet PLM View TEAM View Web View

Latest Work in Progress

FileName	Thumbnail	Revision	Title	Status (Historisch)
N19-11285.iam		A	N19-11285	Work in Progress
T7DS-00M0.iam		A	T7DS-00M0	In Review
T7DS-00M0 (Cartridge Assembly).iam		B	Cartridge Assembly	Released

Properties

N19-11285.iam

System

Änderungsdatum	06.12.2017 13:04
Anfängliche Gene...	
Anfängliche Veröf...	
Anzahl Anlagen	0
Artikel kann zuge...	True
Ausgeh. lokale S...	
Ausgecheckt	06.12.2017 13:04
Ausgecheckt (PC)	
Ausgecheckt von	
Autor	Administrator
Besitzer	MUC1RM6JC2\AUTO...
Datei Repliziert	True
Dateierweiterung	iam
Dateigröße	906240
Dateiname (veralt...	N19-11285.iam
Eigenschaftenkon...	Compliant
Eigenschaftenkon...	Compliant
Eingecheckt	06.12.2017 13:04
Erstellt von	Administrator
FileName	N19-11285.iam
Freigegebene Rev...	False
Geleast bis	21.09.2017 09:14
iLogicRuleStatus	
Kategorienname	Assembly
Kategorienname (...)	Assembly
Klassifizierung	None
Kommentar	Property Edit
Lebenszyklus	Flexible Release Proc...
Lebenszyklus (Hist...	Flexible Release Proc...
Letzte Version	True
Name	N19-11285.iam
Neueste freigege...	False
Provider	Inventor
Revision	A
Revisionsschema	Alphabetische Indexi...

# 2016



### Greater Value

Wide range of the most essential software and services providing value that well exceeds the premium suites at a very competitive price point



### More Flexibility and Choice

Offering both single-user and multi-user access and multiple term lengths to fit your business needs



### Simplicity

One collection per industry with multiple tiers of service



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- Vault Basic
- Navisworks Manage
- Factory Design Utilities
- 3ds Max
- Rendering in A360
- ReCap 360 Pro

### AutoCAD

- AutoCAD Electrical
- AutoCAD Mechanical
- AutoCAD Architecture
- AutoCAD 360



## Autodesk Industry Collections

The most convenient and flexible way to access a wide variety of the most essential Autodesk software used in your industry.

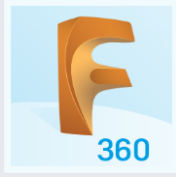


Industry collection composition may be subject to change from time to time at the discretion of Autodesk.

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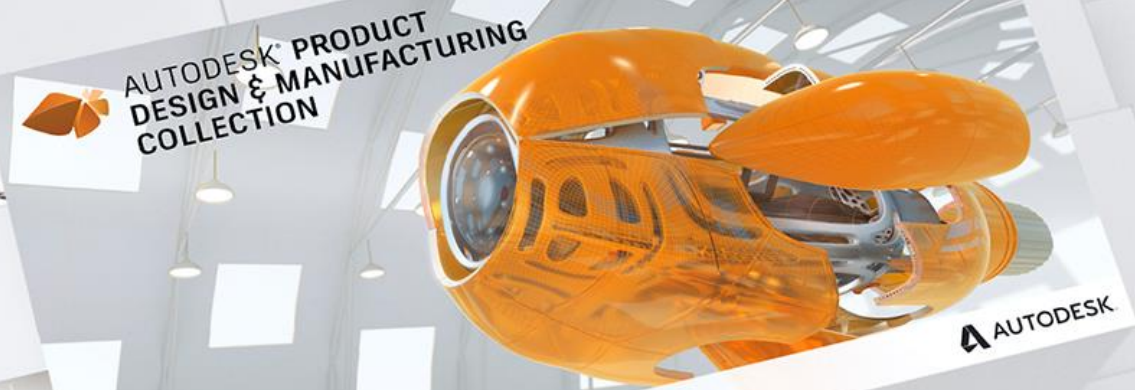
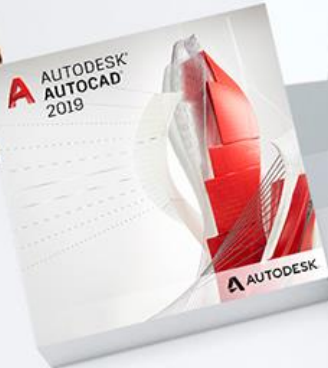




**A** AUTOCAD mobile app



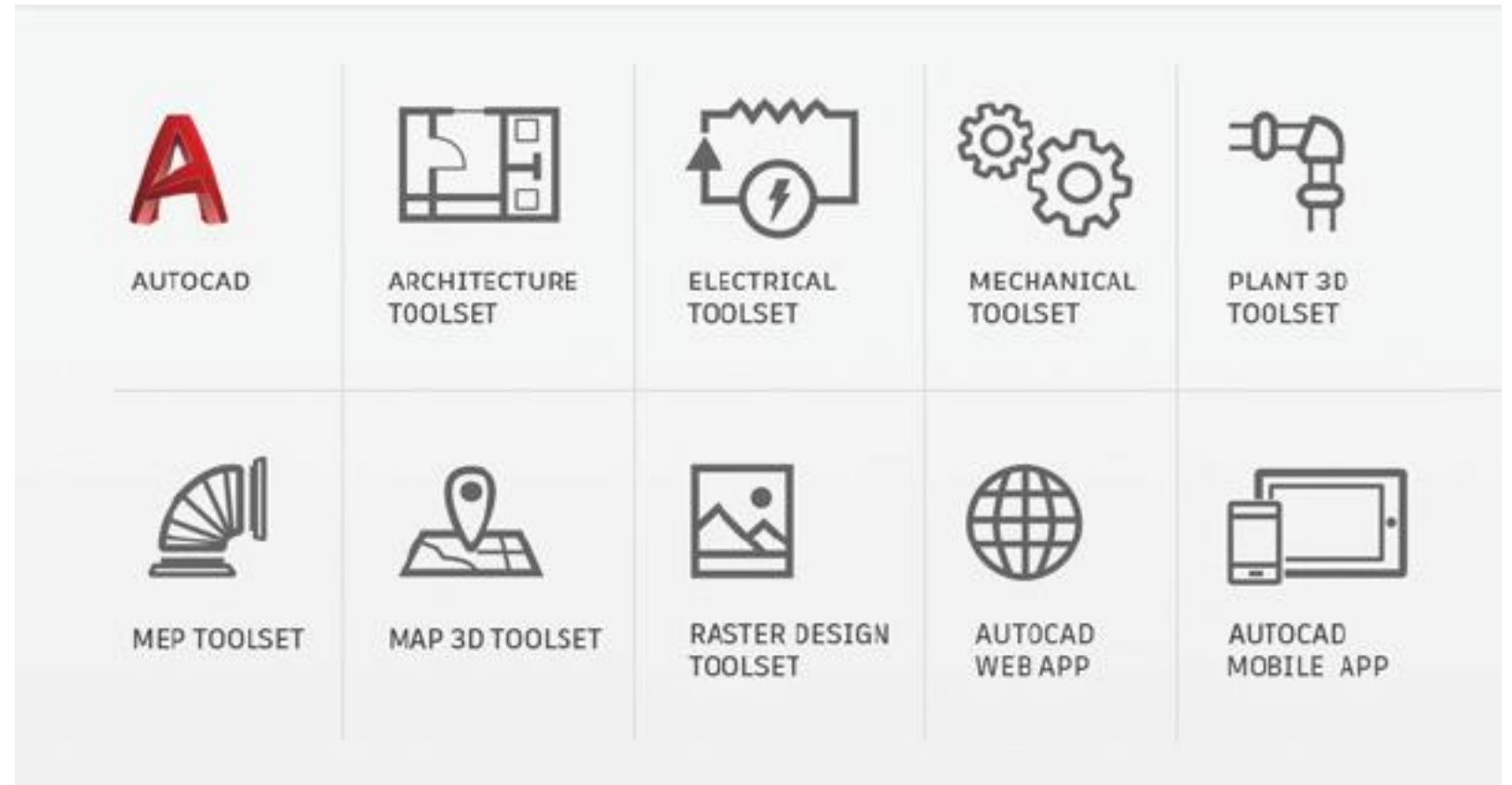
AUTODESK RENDERING





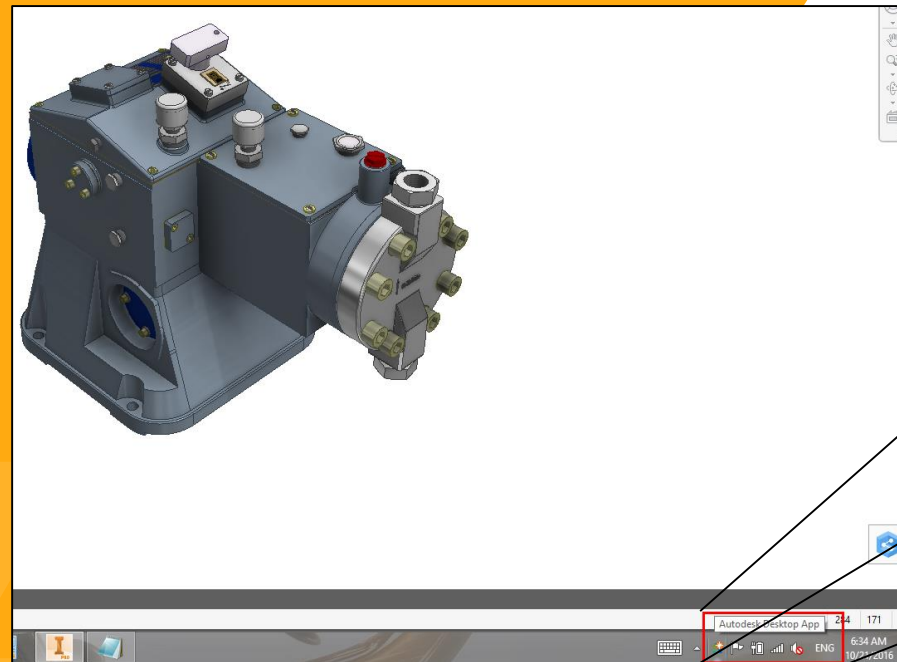
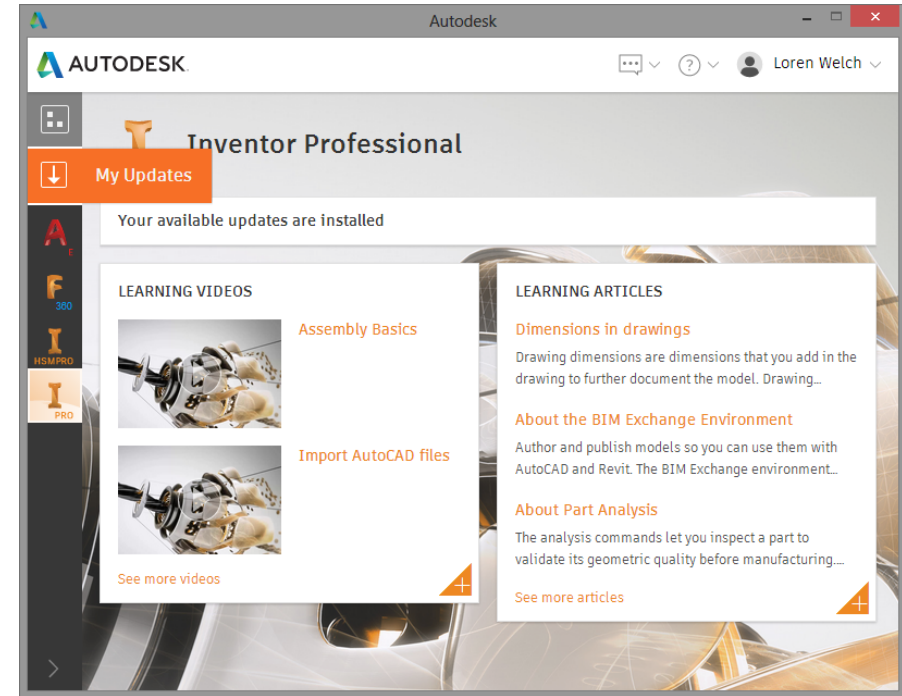
# One Autocad AutoCAD Specialized Toolsets

- Architecture
- Mechanical
- Electrical
- MEP
- Plant 3D
- Map 3D
- Raster Design



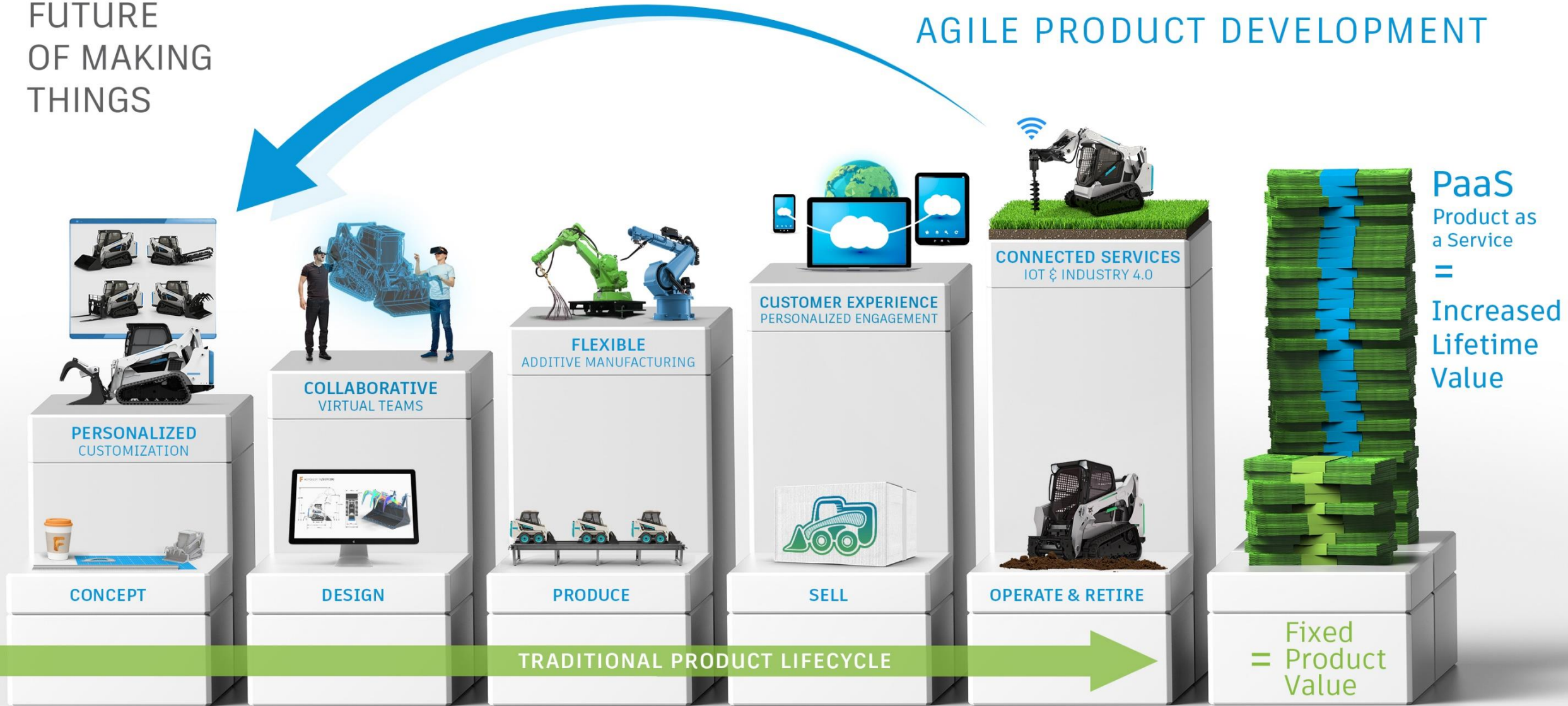
# Accessing Update

- ▶ Autodesk Desktop App
- ▶ Autodesk Account



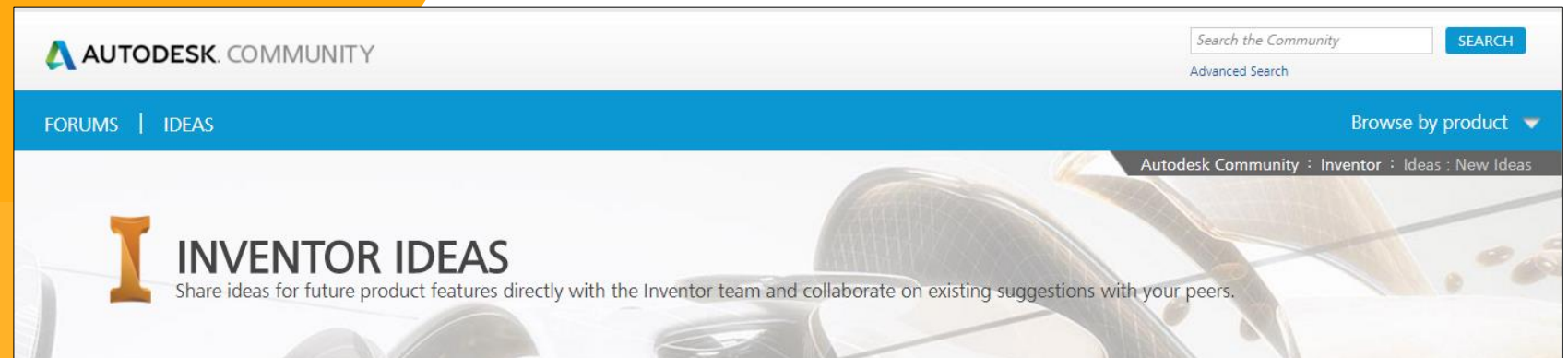
# THE FUTURE OF MAKING THINGS

# AGILE PRODUCT DEVELOPMENT



# Make your voice heard

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<https://autode.sk/InventorBeta>
- ▶ Inventor Ideas Page  
<https://autode.sk/InventorIdeas>





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