(MFG329807) I Got You Babe: When Fusion 360 & PowerMill Come Together

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Business Strategy & Marketing

Spencer Hardcastle

Process Specialist

Customer Advocacy Organization

AUTODESK. UNIVERSITY

Safe Harbour

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Agenda

01 Introduction

02 Fusion 360

03 PowerMill

04 Workflow Scenarios

05 Summary

06 Q&A

Class Summary

Everyone is experiencing the skills gap change to some degree. With the increasing breadth of this issue looming over manufacturing, automating processes have become paramount to every business. Many CAD/CAM products offer solutions that come close; however, they leave people feeling daunted, which causes more of a setback, rather than a solution.

In this class, we'll demonstrate how the new generation of cloud and advanced manufacturing solutions will help close the gap. The goal is to communicate how Fusion 360 and PowerMill can improve the efficiency of subtractivey manufacturing your parts, increasing productivity, and complementing your existing workflows.

About the speakers

Rob Walker

A senior technical marketing manager at Autodesk, where he and his team are responsible for helping customers understand how they can achieve their manufacturing goals, using the advanced manufacturing solutions that Autodesk offers.

Rob graduated from the University of Liverpool with a bachelor’s degree in Aerospace Engineering and a master's degree in Product Design and Management before embarking on a career with Delcam as an applications engineer. Initially starting in the UK department, he trained and supported UK customers, before moving into an international role, where he assisted the global network of subsidiaries and resellers in both pre- and post-sales activities. Following the acquisition of Delcam by Autodesk in 2014, he moved to technical marketing, and is now in his sixteenth year of service.

About the speakers

Spencer Hardcastle

Graduating from Loughborough University with a Master’s degree in Automotive Engineering, began his career with Delcam on the graduate scheme. This led to a role as an Applications Engineer in the International Support department, which involved training and supporting customers and resellers worldwide, in both pre and post-sales activities.

Following the acquisition of Delcam by Autodesk, he now works as a Process Specialist in the Customer Advocacy Organization, working to drive adoption and retention of Fusion 360. In his spare time, Spencer like to keep active, enjoying golf, football and more.

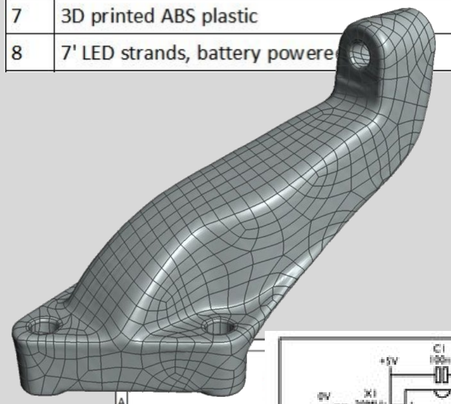

AUTODESK INVENTOR CAM 2020
AUTODESK AUTOCAD MECHANICAL 2020
AUTODESK ADVANCE STEEL 2020
AUTODESK NETFABB 2020
AUTODESK TRUNEST 2020
AUTODESK MOTIONBUILDER 2020
AUTODESK AUTOCAD ELECTRICAL 2020
AUTODESK POWERINSPECT 2020
AUTODESK AUTOCAD PLANT 3D 2020
AUTODESK VRED DESIGN 2020
AUTODESK AUTOCAD MEP 2020
AUTODESK REVIT LT SUITE 2020
AUTODESK AUTOCAD MECHANICAL 2020
AUTODESK STRUCTURAL BRIDGE DESIGN 2020
AUTODESK ROBOT STRUCTURAL ANALYSIS PROFESSIONAL
AUTODESK AUTOCAD MECHANICAL 2020
AUTODESK HELIUS PFA 2020
AUTODESK AUTOCAD MAP 3D 2020
AUTODESK ARNOLD
AUTODESK CFD 2020
AUTODESK VRED DESIGN 2020
AUTODESK TRUNEST 2020
AUTODESK HSM 2020
AUTODESK ROBOT STRUCTURAL ANALYSIS PROFESSIONAL
AUTODESK VAULT WORKGROUP 2020
AUTODESK FEATURECAM 2020
AUTODESK AUTOCAD MAP 3D 2020
AUTODESK NETFABB 2020
AUTODESK ALIAS SPEEDFORM 2020
AUTODESK FLARE 2020
AUTODESK POWERINSPECT 2020
AUTODESK AUTOCAD PLANT 3D 2020
AUTODESK FABRICATION CAMDUCT 2020
AUTODESK AUTOCAD ELECTRICAL 2020
AUTODESK MAYA 2020
AUTODESK 3DS MAX 2020
AUTODESK AUTOCAD 2020
AUTODESK REVIT 2020
AUTODESK FUSION 360
AUTODESK INVENTOR 2020
AUTODESK ALIAS SURFACE 2020
AUTODESK POWERMILL 2020
AUTODESK FLAME 2020
AUTODESK

An Introduction to Fusion 360

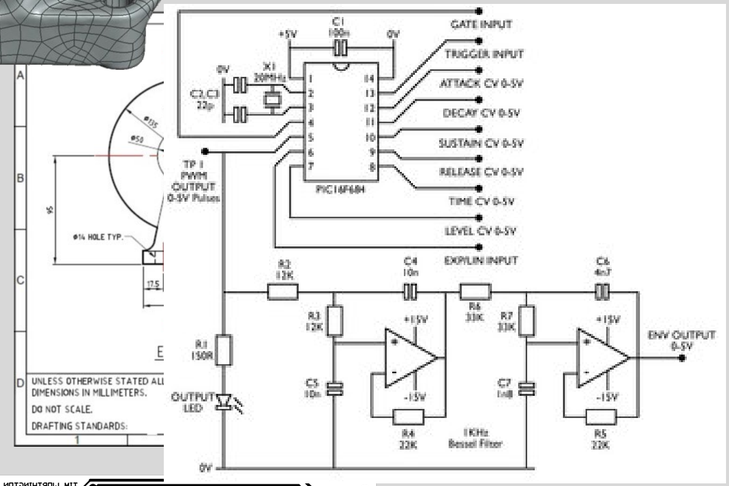
What is Fusion 360?

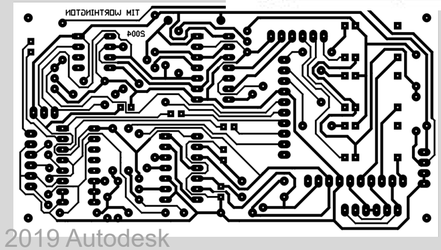
DATA

	Part Name	Part Description	Quantity
1	Pololu Power HD Micro Servo HD-1800A	Plucking motors	6
2	Pololu Continuous Rotation Servo 1248	Tuning motors	6
3	Black Delrin rod 3/4” diameter	Tuning peg attachments	6
4	Clear Polycarbonate 1/4” sheet	Guitar stand material	1
5	Black Delrin bar 1” thick	Guitar neck support material	1
6	National Instruments myRio-1900	Microcontroller	1
7	3D printed ABS plastic	Guitar pick holders	6
8	7' LED strands, battery powered	[illegible]	[illegible]



```
G0 Z2
G0 X28.7896 Y10.2558
G0 Z0.1
G1 Z-0.1 F100
G1 X28.8448 Y10.2470 F300
G1 X28.8994 Y10.2330
G1 X28.9528 Y10.2139
G1 X29.0042 Y10.1892
G1 X29.0531 Y10.1587
G1 X29.1001 Y10.1238
G1 X29.1439 Y10.0831
G1 X30.0837 Y9.1179
```





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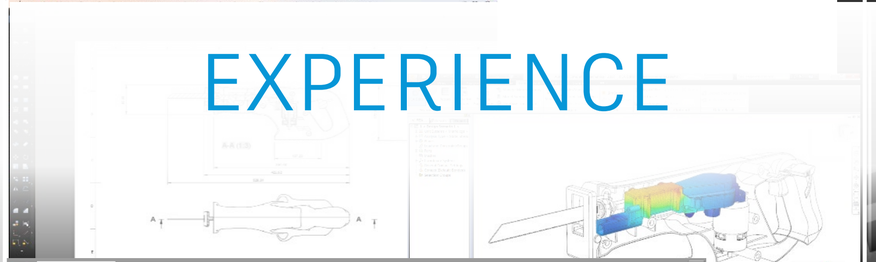
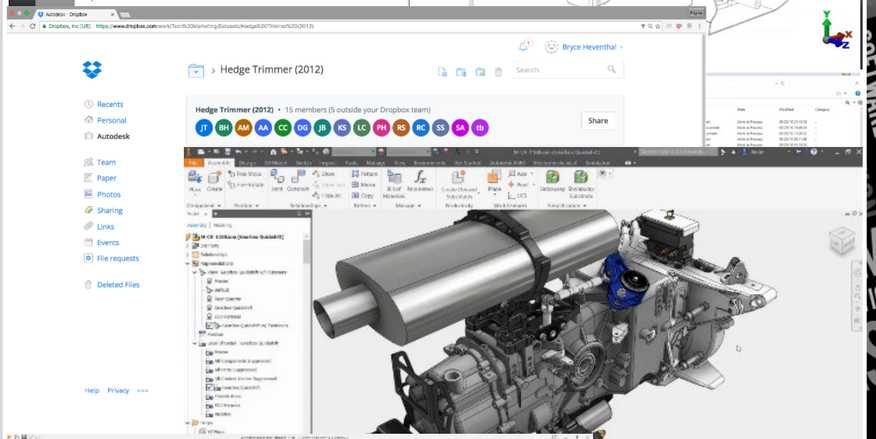
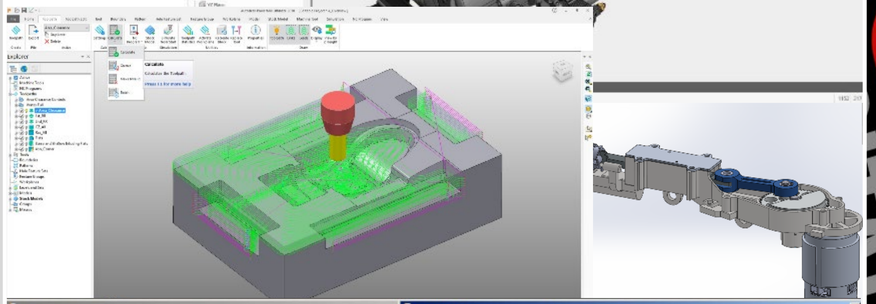
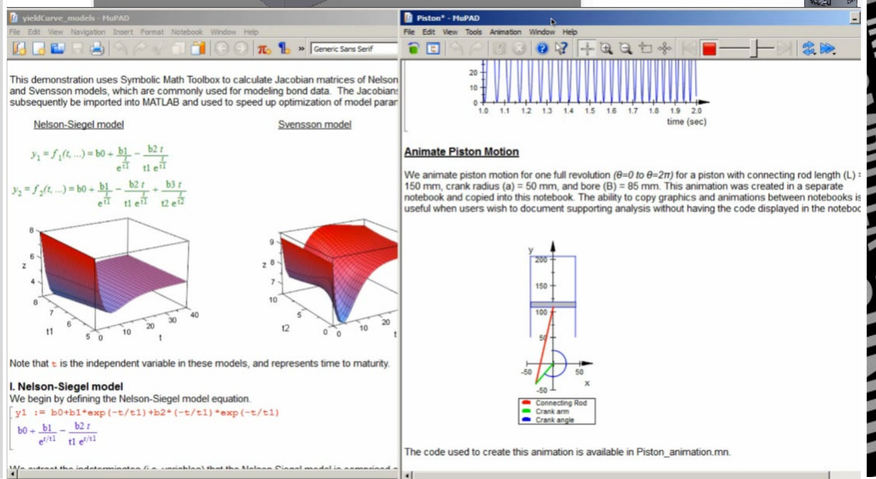
EXPERIENCE

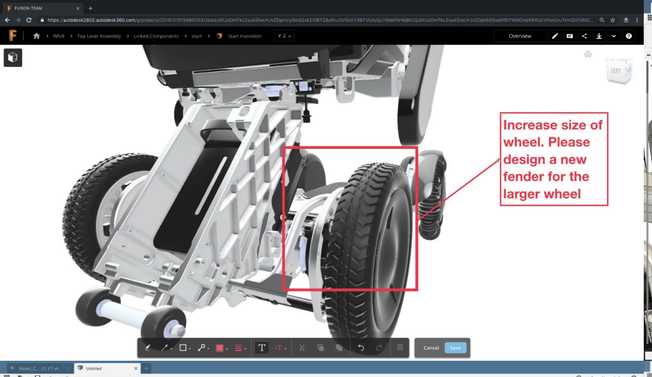


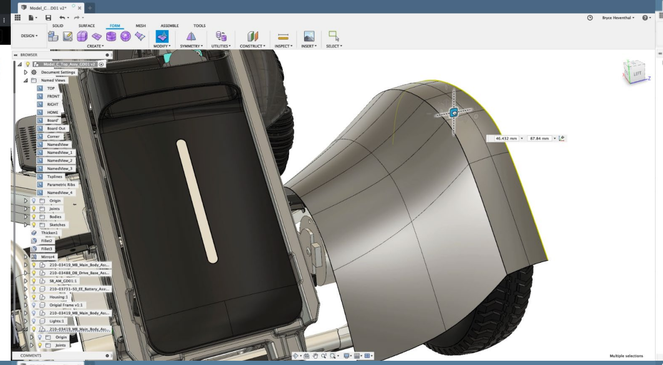


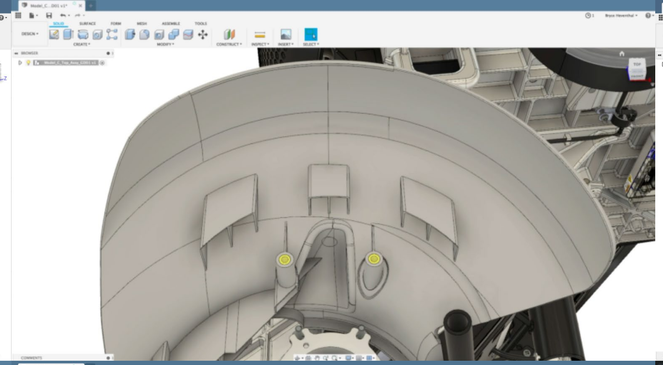


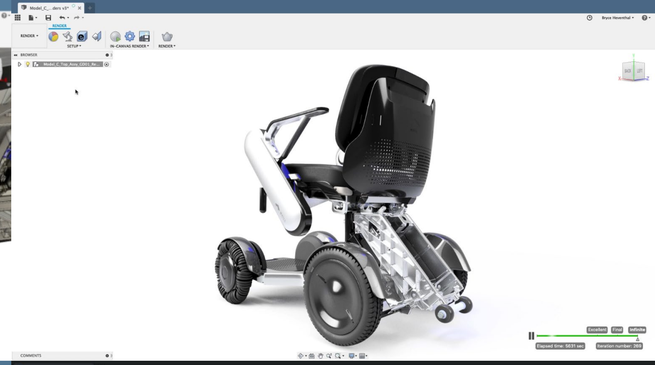


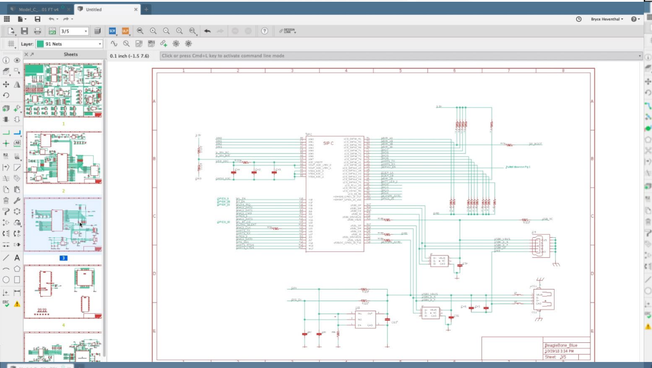
TECHNOLOGY

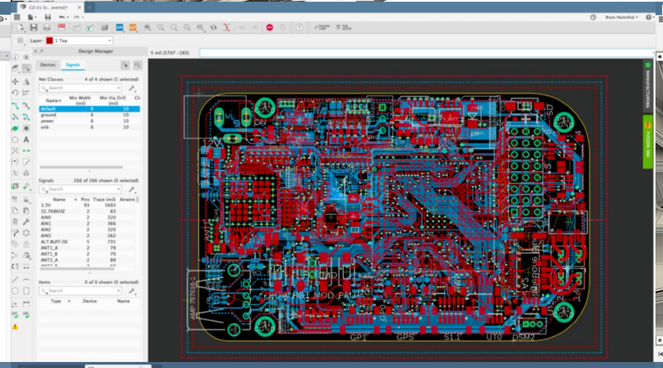

Increase size of wheel. Please design a new fender for the larger wheel
Cancel
Save

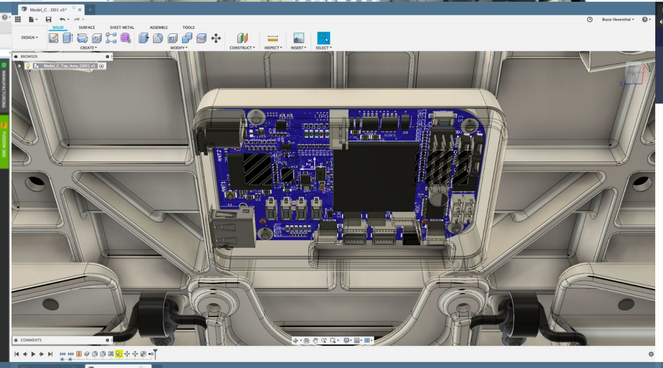


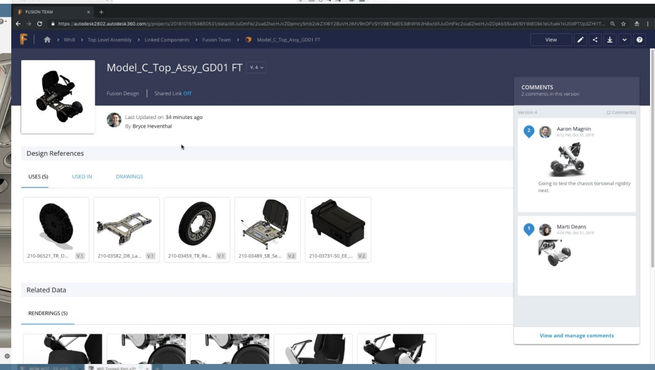


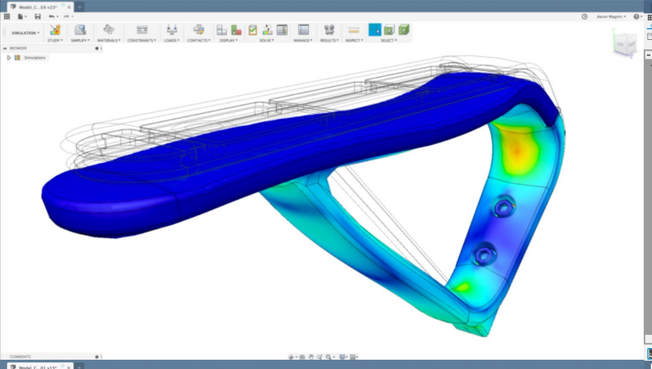


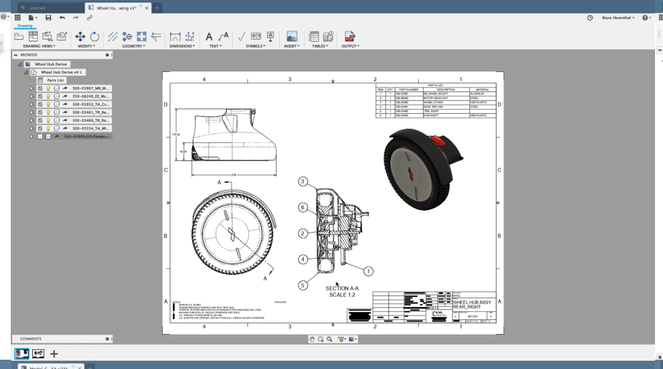


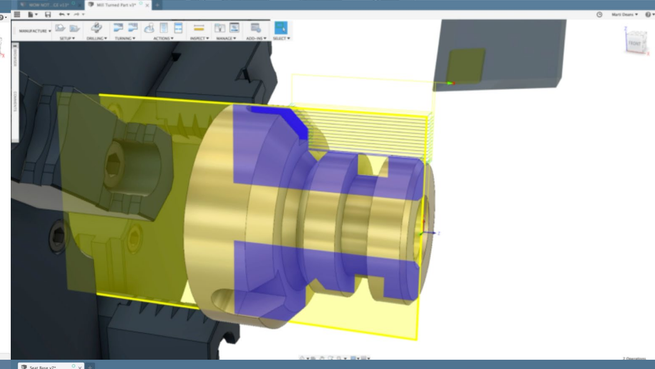


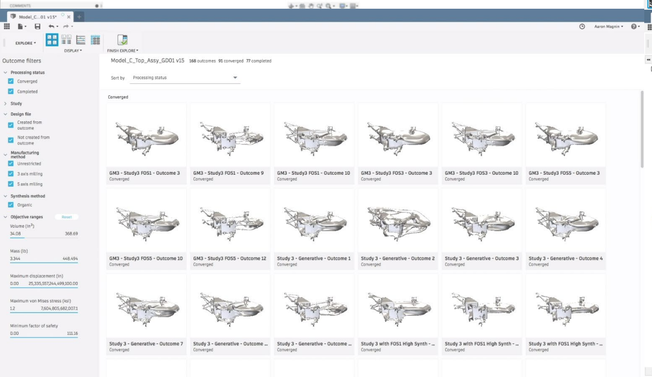


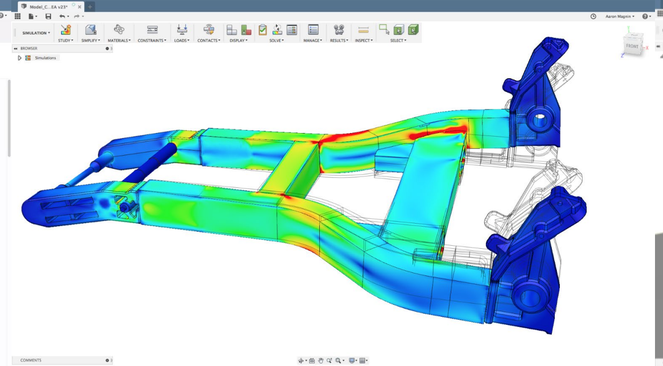

Model_C_Top_Assy_GD01 FT
Design References
Related Data
RENDERINGS (5)
COMMENTS
View and manage comments

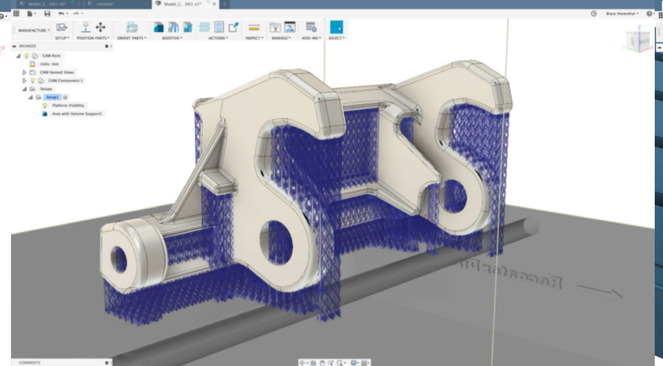


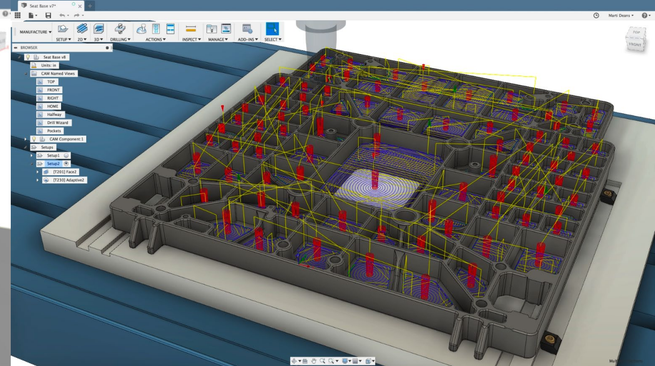

SECTION A-A
SCALE 1:2




Outcome filters
Model_C_Top_Assy_GD01 v15

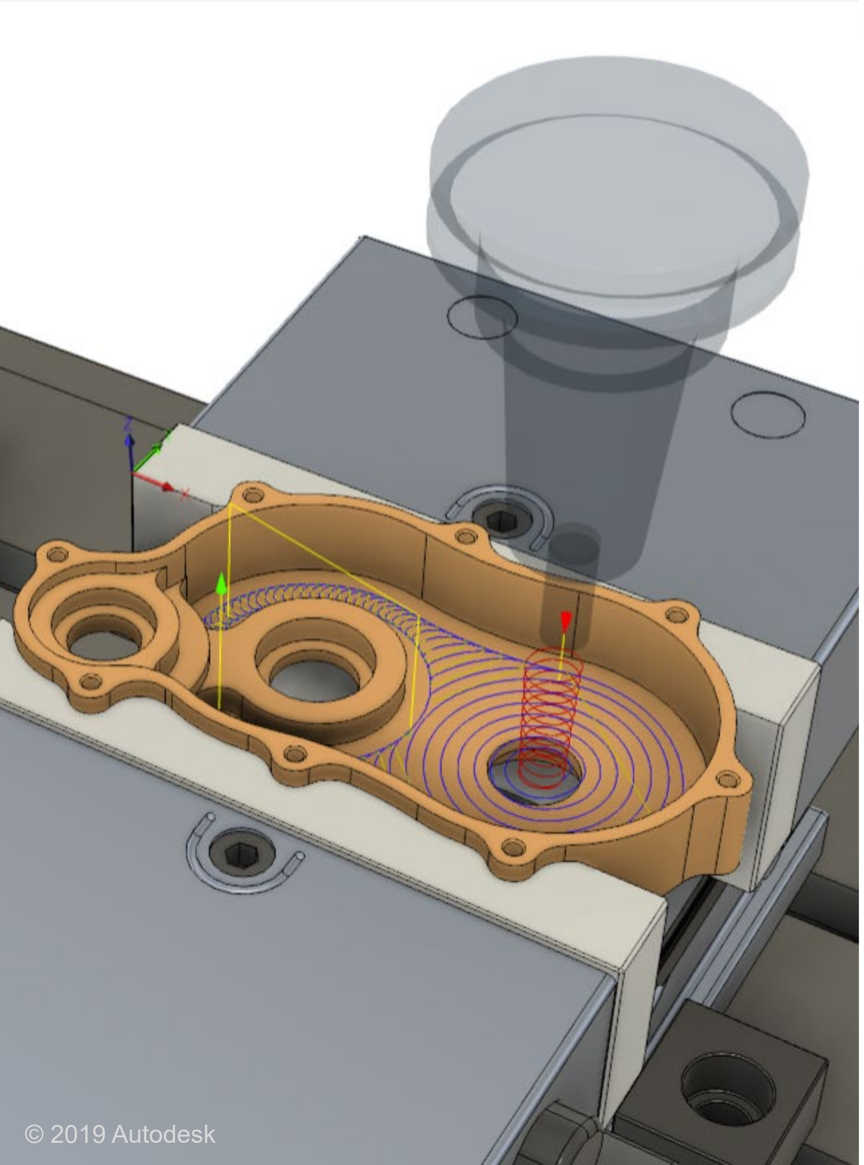






Why Fusion 360?

INTEGRATED



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COLLABORATIVE

ACCESSIBLE

Manufacturing has changed.
So should your tools.

DISCONNECTED PROCESSES

COMMUNICATION BREAKDOWN

MISSING DEADLINES

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INTEGRATED

GO FROM DESIGN TO MACHINING FASTER

Changes Update Associatively; No File Conversions

COLLABORATIVE

COMMUNICATE FASTER

With Designers, Engineers, and Machine Operators

COLLABORATIVE

INDIVIDUAL LICENSE

THE CLOUD

DATA CONSOLIDATION

ACCESSIBLE

HAAS ST-10
Download / Sample / Share / RSS
Haas Automation
Purpose: Mill / Turn
Version: 42302
Changed: 30 days ago
Extension: nc
Downloads: 1706
Preconfigured HAAS ST-10 post with support for mill-turn
Recent changes

DMG Mori NLX Mill/Turn
Download / Share / RSS
DMG MORI
Purpose: Mill / Turn
Version: 42319
Changed: 26 days ago
Extension: nc
Downloads: 2
DMG Mori NLX post with support for mill-turn and a CELOS control with MAPPS.
Recent changes

HAAS ST-35
Download / Sample / Share / RSS
Extension: nc
Downloads: 259
Preconfigured HAAS ST-35 post with support for mill-turn. You can force t
Recent changes

Mitsubishi
Download / Share / RSS
Mitsubishi
Purpose: Milling
Version: 42285
Changed: 86 days ago
Extension: nc
Downloads: 2
Generic milling post for Mitsubishi.
Recent changes

Mazak
Download / Share / RSS
Mazak
Purpose: Milling
Version: 42285
Changed: 86 days ago
Extension: eia
Downloads: 1
Generic milling post for Mazak.
Recent changes

HAAS ST-20Y
Download / Sample / Share / RSS
Haas Automation
Purpose: Mill / Turn
Version: 42302
Changed: 30 days ago
Extension: nc
Downloads: 1386
Preconfigured HAAS ST-20Y post with support for mill-tur
Recent changes

DMG Mori CMX with FANUC control
Download / Share / RSS
DMG MORI
Purpose: Milling
Version: 42298
Changed: 62 days ago
Extension: nc
DMG Mori CMX series horizontal machining center with optional rotary table and a FANUC
Recent changes

HAAS ST-25
Download / Sample / Share / RSS
Haas Automation
Purpose: Mill / Turn
Version: 42302
Changed: 30 days ago
Extension: nc
Downloads: 236
Preconfigured HAAS ST-25 post with support for mill-turn. You can force t
Recent changes

Mitsubishi Turning
Download / Share / RSS
Mitsubishi
Purpose: Turning
Version: 42207
Changed: 203 days ago
Extension: nc
Downloads: 1
Generic turning post for Mitsubishi control. Use the property 'type' to switch the Mitsubishi Turret 102 for QCTP on X+ Post, Turret 103 for Gang Tooling on X- Post, Turret 104 for Gang T
Recent changes

Mazak Laser
Download / Share / RSS
Mazak
Purpose: Waterjet / Laser / Plasma
Version: 42115
Changed: 294 days ago
Extension: ncc
Generic post for Mazak laser cutting.
Recent changes

HAAS ST-20
Download / Sample / Share / RSS
Haas Automation
Purpose: Mill / Turn
Version: 42302
Changed: 30 days ago
Extension: nc
Downloads: 1213
Preconfigured HAAS ST-20 post with support for mill-turn
Recent changes

FANUC
Download / Share / RSS
Fanuc
Purpose: Milling
Version: 42357
Changed: A day ago
Extension: nc
Downloads: 10
Generic post for Fanuc.
Recent changes

HAAS DS-30Y
Download / Sample / Share / RSS
Haas Automation
Purpose: Mill / Turn
Version: 42302
Changed: 30 days ago
Extension: nc
Downloads: 326
Preconfigured HAAS DS-30Y post with support for mill-turn. You can f
Recent changes

Fadal
Download / Share / RSS
Fadal
Purpose: Milling
Version: 42285
Changed: 86 days ago
Extension: nc
Generic milling post for Fadal.
Recent changes

Mazak Mill with rotary table
Download / Share / RSS
Mazak
Purpose: Milling
Version: 42315
Changed: 29 days ago
Extension: eia
Downloads: 1
Generic milling post for Mazak with a rotary table.
Recent changes

HAAS ST-30
Download / Sample / Share / RSS
Haas Automation
Purpose: Mill / Turn
Version: 42302
Changed: 30 days ago
Extension: nc
Downloads: 517
Preconfigured HAAS ST-30 post with support for mill-turn. You can fo
Recent changes

FANUC Turning
Download / Share / RSS
Fanuc
Purpose: Turning
Version: 42233
Changed: 152 days ago
Extension: nc
Downloads: 2
Generic turning post for FANUC. Use the property 'type' to switch the FANUC mode A, B, and C. The c for QCTP on X+ Post, Turret 103 for Gang Tooling on X- Post, Turret 104 for Gang Tooling on X+ Tool Pos
Recent changes

HAAS ST-35Y
Download / Sample / Share / RSS
Haas Automation
Purpose: Mill / Turn
Version: 42302
Changed: 30 days ago
Extension: nc
Downloads: 299
Preconfigured HAAS ST-35Y post with support for mill-turn
Recent changes

Siemens Turning
Download / Share / RSS
Siemens
Purpose: Turning
Version: 42316
Changed: 28 days ago
Extension: mpf
Downloads: 1
Generic lathe post for Siemens. Use Turret 0 for Positional Turret, Turret 101 for QCTP on X+ on X+ Tool Post.
Recent changes

Siemens SINUMERIK 840C
Download / Share / RSS
Siemens
Purpose: Milling
Version: 42353
Changed: 2 days ago
Extension: mpf
Downloads: 1
Generic post for Siemens 840C. Note that the post will use D1 alw
Recent changes

HAAS ST-30Y
Download / Sample / Share / RSS
Haas Automation
Purpose: Mill / Turn
Version: 42302
Changed: 30 days ago
Extension: nc
Downloads: 648
Preconfigured HAAS ST-30Y post with support for mill-turn. Yo
Recent changes

HURCO
Download / Share / RSS
HURCO
Purpose: Milling
Version: 42285
Changed: 86 days ago
Extension: hnc
Downloads: 3
Generic post for HURCO. Note that this post supports both ISNC (ISO NC mode) and BNC (E property. Also note that you can turn on 3D arcs by enabling the 'allow3DArcs' property so y
Recent changes

HAAS ST-25Y
Download / Sample / Share / RSS
Haas Automation
Purpose: Mill / Turn
Version: 42302
Changed: 30 days ago
Extension: nc
Downloads: 263
Preconfigured HAAS ST-25Y post with support for mill-turn
Recent changes

Siemens Mill-Turn
Download / Share / RSS
Siemens
Purpose: Mill / Turn
Version: 42319
Changed: 26 days ago
Extension: mpf
Downloads: 6
Generic Siemens mill-turn post. This post must be customized for the particular capbilitie
Recent changes

Siemens SINUMERIK 802D
Download / Share / RSS
Siemens
Purpose: Milling
Version: 42316
Changed: 28 days ago
Extension: mpf
Generic post for Siemens SINUMERIK 802D.
Recent changes

HAAS ST-15
Download / Sample / Share / RSS
Haas Automation
Purpose: Mill / Turn
Version: 42302
Changed: 30 days ago
Extension: nc
Downloads: 384
Preconfigured HAAS ST-15 post with support for mill-turn. You
Recent changes

HURCO 3D
Download / Share / RSS
HURCO
Purpose: Milling
Version: 42285
Changed: 86 days ago
Extension: hnc
Downloads: 1
Generic post for older 3-axis HURCO NC. Use this post suggestion for ISNC NC mod Enabling the 'use segments'

HAAS DS-30SSY
Download / Sample / Share / RSS
Haas Automation
Purpose: Mill / Turn
Version: 42302
Changed: 30 days ago
Extension: nc
Downloads: 2
Preconfigured HAAS DS-30SSY post with support for mill-t

Siemens SINUMERIK 810D
Download / Share / RSS
Siemens
Purpose: Milling
Changed: 2 days ago
Extension: mpf
Generic post for Siemens SINUMERIK 810D.

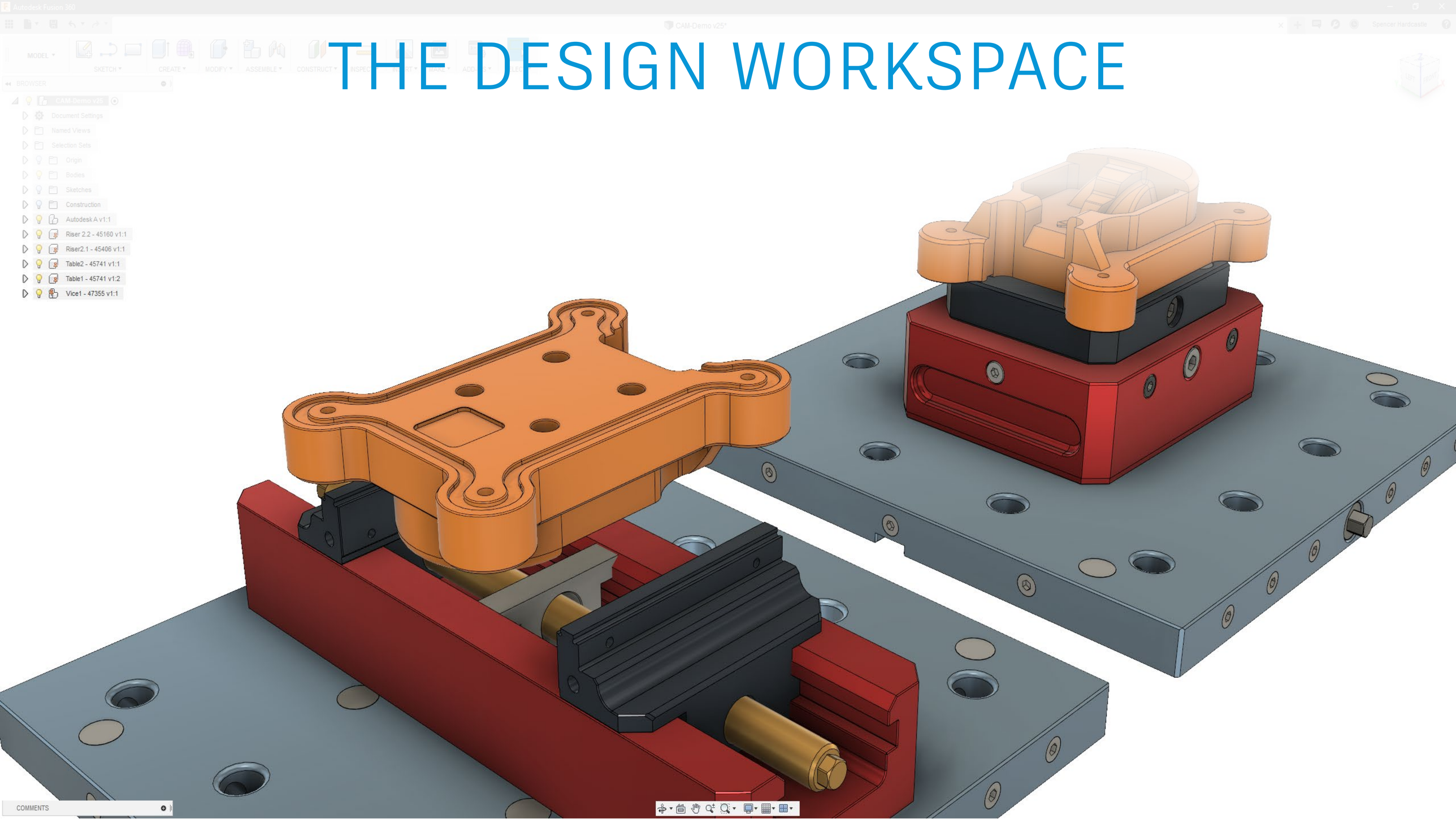
Siemens SINUMERIK 840D Inspe
Download / Share / RSS
Siemens
Purpose: Milling
Version: 42353
Changed: 2 days ago
Extension: mpf
Downloads: 3
Generic post for Siemens 840D with inspection capabilities. No
Recent changes

DATA, TRAINING, TECHNOLOGY

Across Devices, Posts Processors, Training, & Consumption Services

The Workspaces

THE DESIGN WORKSPACE

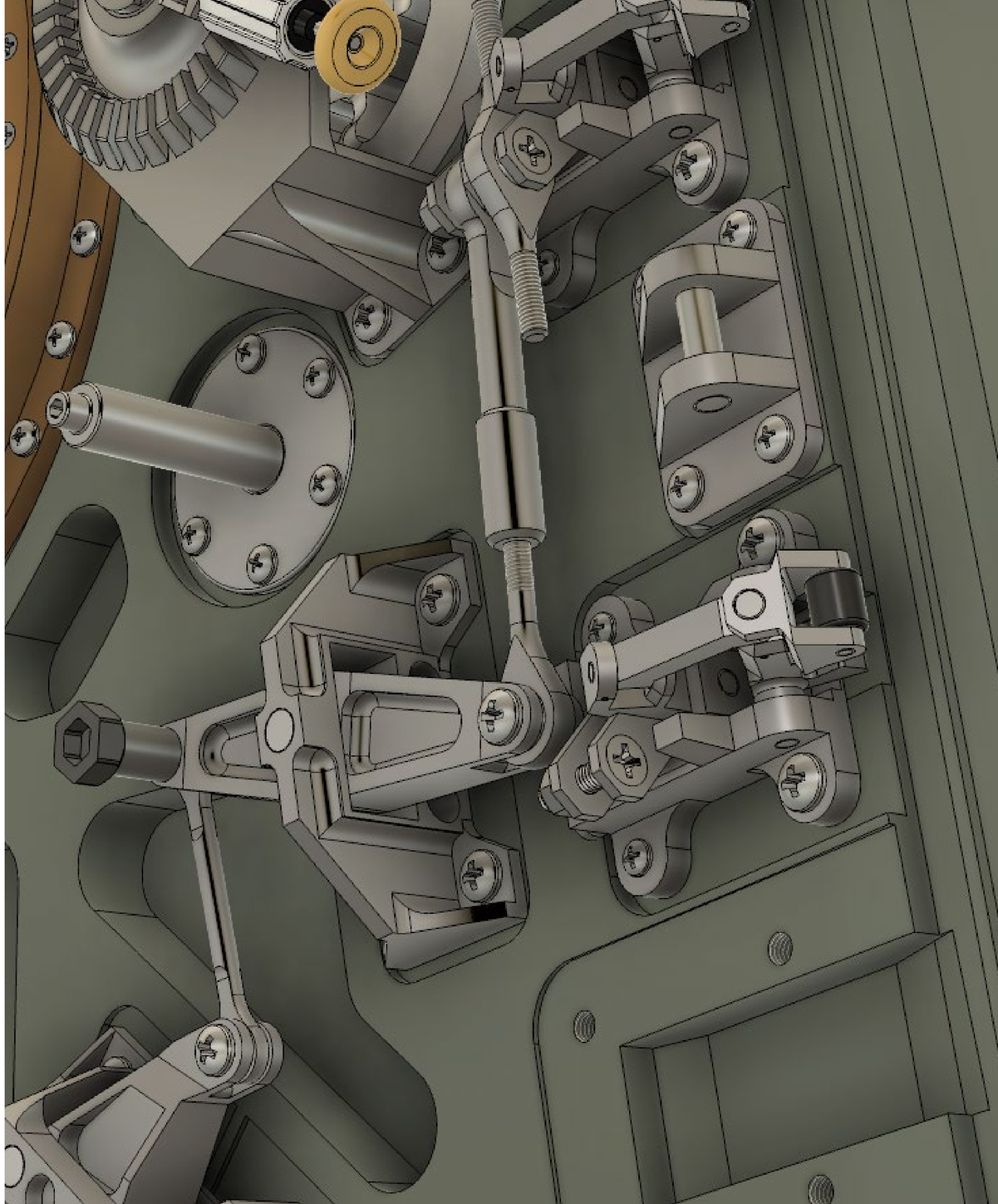


Design

- Designing in Fusion 360 is split across multiple disciplines
  - Model
  - Patch
  - Sheet Metal
  - Sculpt
  - Mesh

- Turn concept sketches into models efficiently with multiple modeling techniques

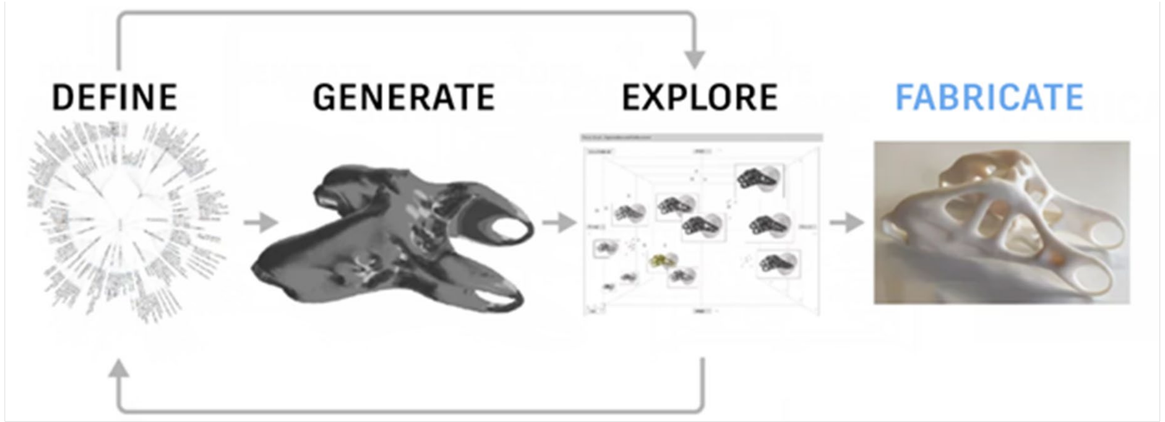
- Industrial designers, product designers, and engineers in the same environment

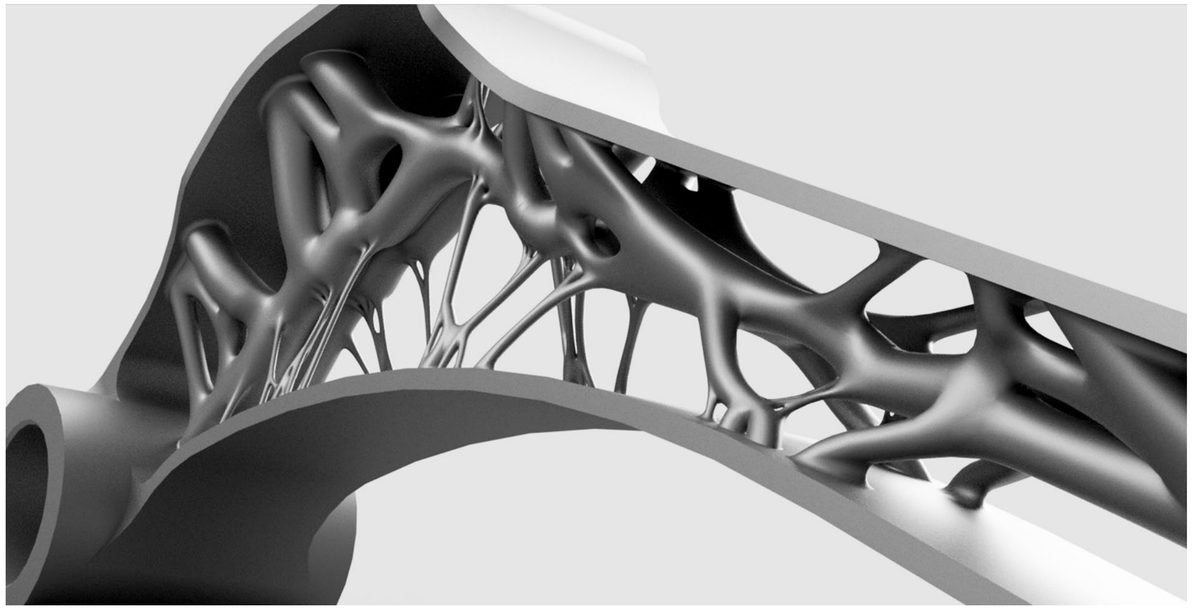


GENERATIVE DESIGN

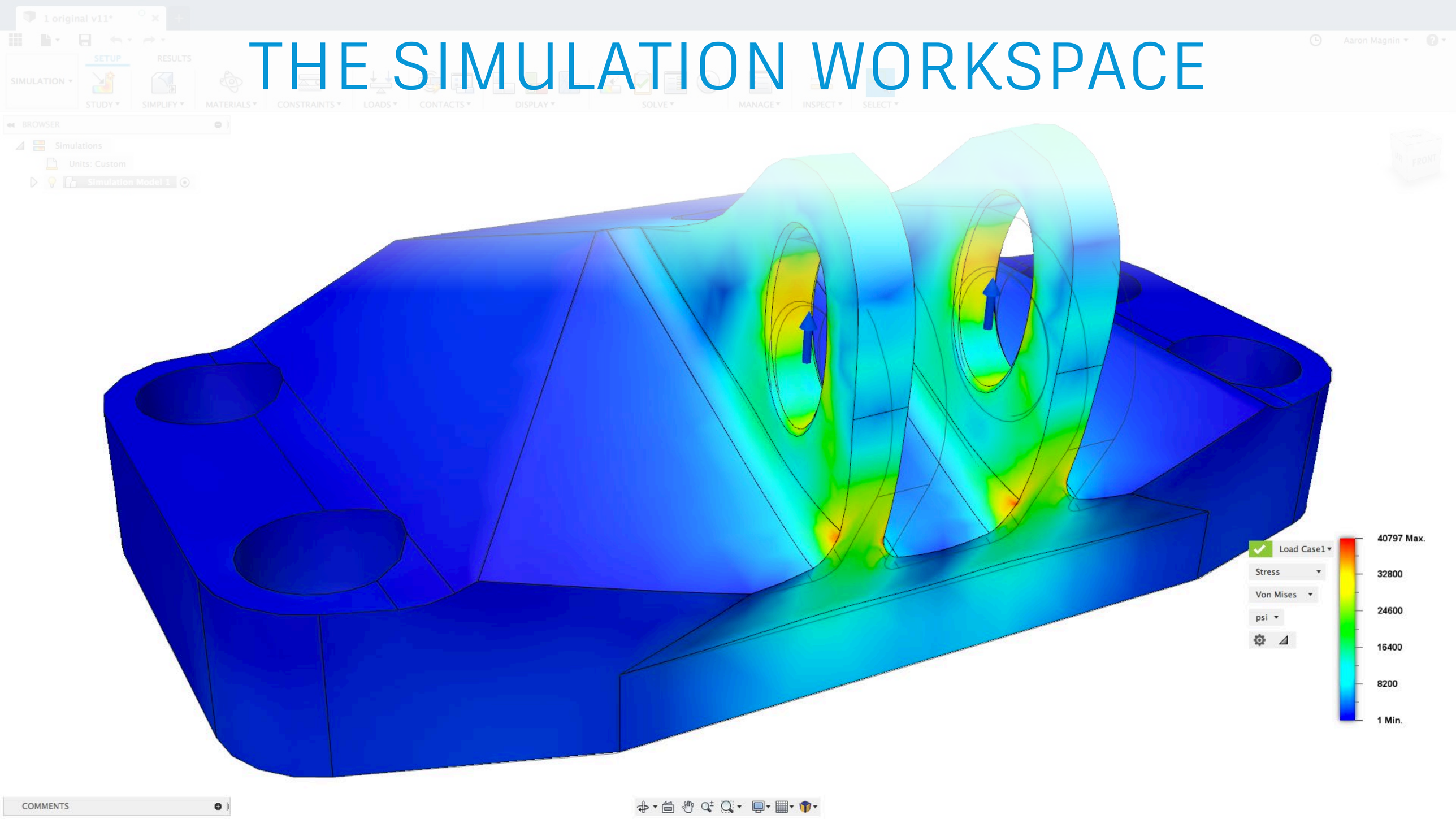
Generative Design

- Define a design problem through goals and constraints
  - Preserve & Obstacle Geometry
  - Loading Conditions
  - Manufacturing
- Generate a series of designs that meet these requirements, while adhering to set design Criteria
- Explore the options to select the optimal design for manufacture





THE SIMULATION WORKSPACE



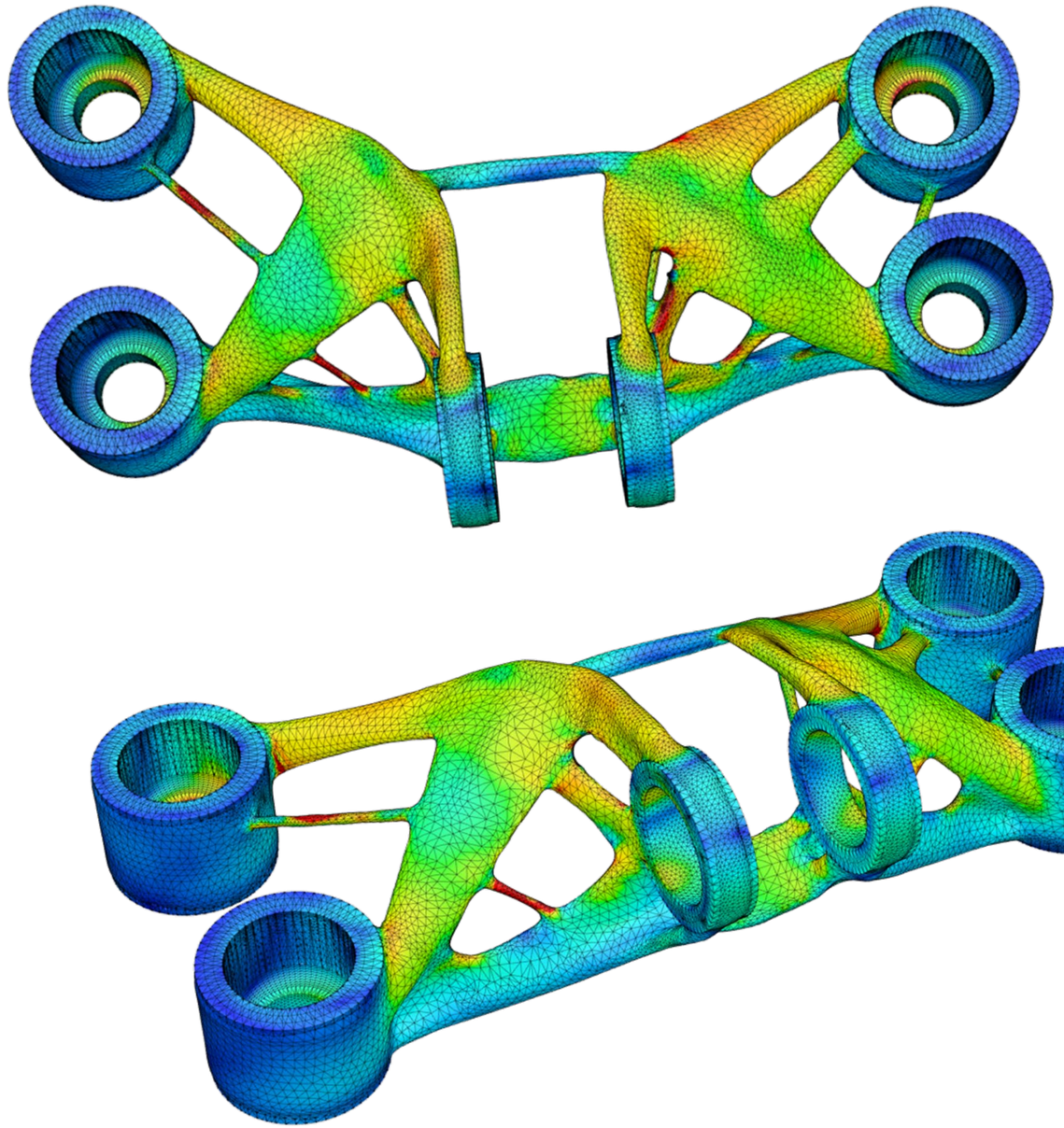
Simulation

- Perform a variety of analyses;
  - Stress (static, nonlinear static, and event simulation)
  - Modal
  - Buckling
  - Thermal
  - Shape optimization

- Determine how loads lead to deformation and failure, natural vibration frequencies cause resonance and understand temperature distributions

- Save time as you experiment with virtual design variations or adapt to changing design requirements

- Minimize physical prototyping and destructive testing requirements



THE MANUFACTURE WORKSPACE

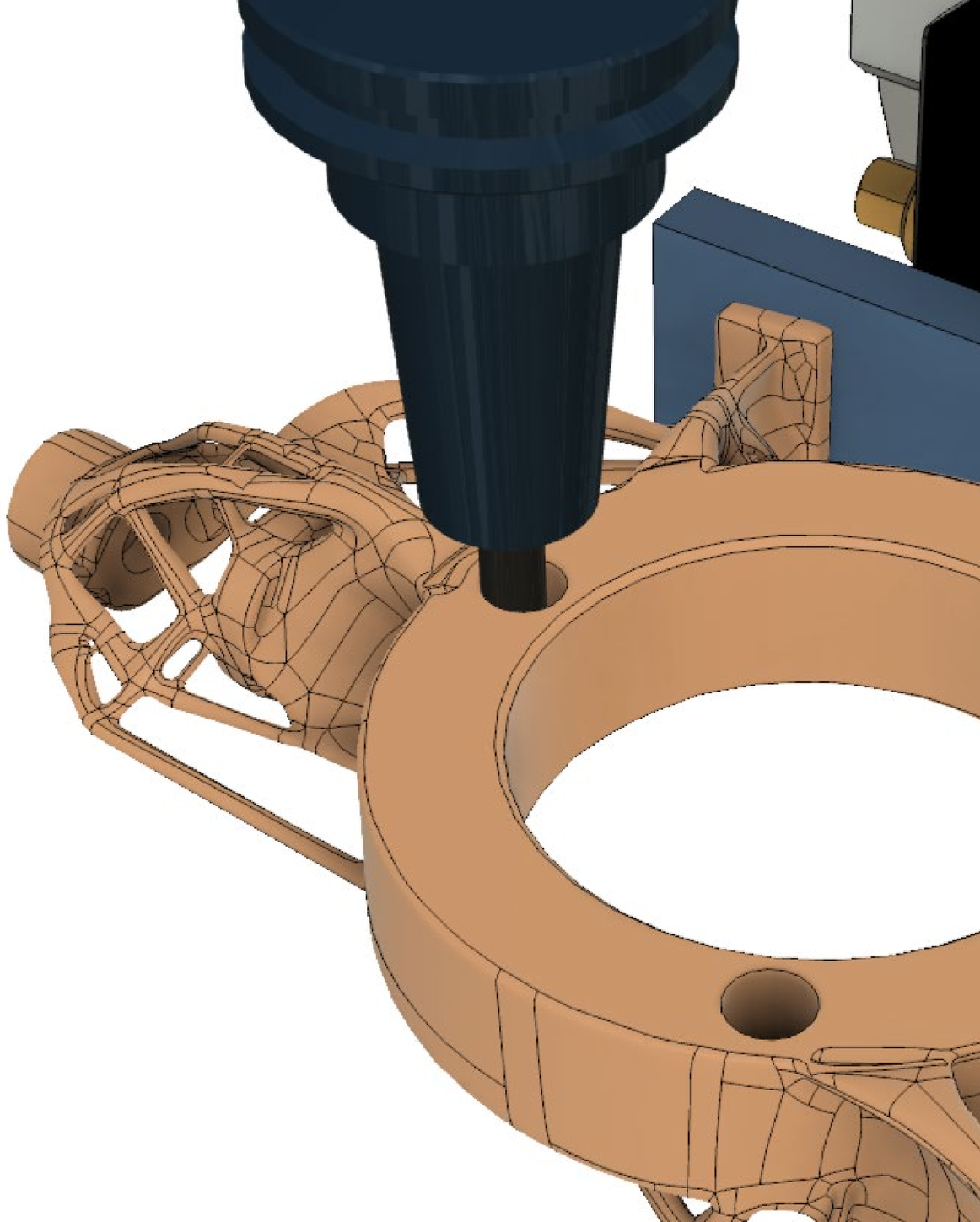
Manufacture

- Combine a variety of different manufacturing techniques including;
  - Additive
  - Milling
  - Turning & Turn/Mill
  - Profile Cutting

- Multi-core engine calculates toolpaths quickly, reducing programming time

- Stock simulation provides toolpath verification

- Use a vast library of free and customisable post processors to turn your parts into reality



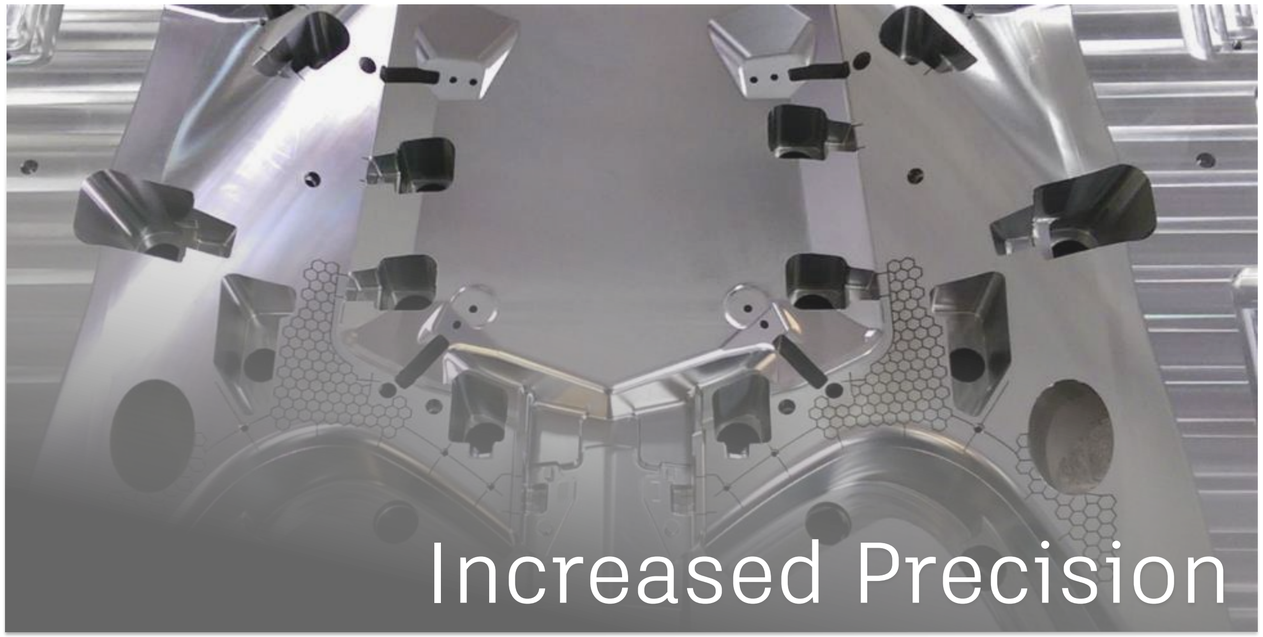
An Introduction to PowerMill

What is PowerMill?

PowerMill is expert CAM software for manufacturers of molds, dies and highly complex components wanting to achieve the maximum quality, control, and efficiency from their 3- and 5-axis CNC machines

Industry Challenges


Greater Complexity


Increased Precision


Control and Flexibility


New Technology


Performance


Manual Rework


FIDIA
Confidence

Why PowerMill?

Exceptional control of your high-speed and multi-axis machinery

DEDICATED

EXPERT

TRUSTED

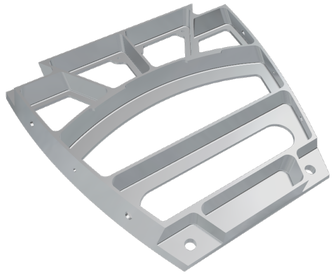
Autodesk PowerMill

- **Expert** CAM software for manufacturers of moulds, dies and highly complex components
  - Achieve maximum quality, control and efficiency from 3 and 5-axis CNC machines
- **Dedicated** to producing exceptional precision & quality
  - Remove the need for manual polishing
  - More higher value business can be won
- High degree of control & flexibility
- **Trusted** to deliver
  - Confidence to run machines unattended

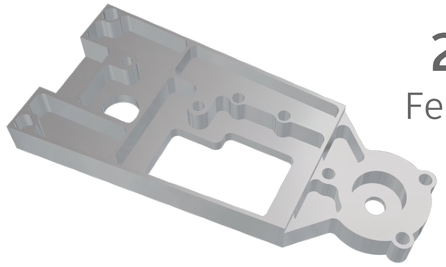
A Solution Dedicated to Exceptional Quality

High-Speed
Vortex roughing
Finishing strategies
Toolpath editing

5-Axis
Swarf finishing
Toolaxis Control
Motion optimization

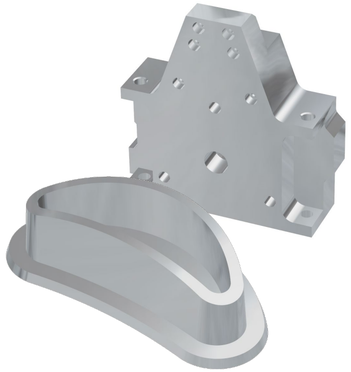


Expert CAM for High Speed and Multi-axis



2D Milling
Feature detection
Drilling
Pocketing
Chamfering

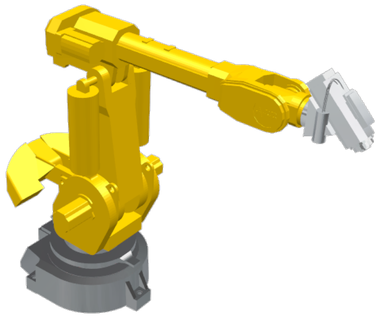
Mill-Turn
Facing
Slotting
Boring
Turning



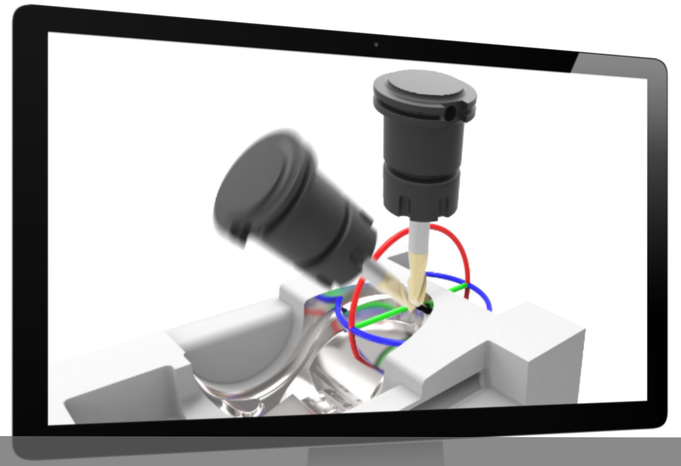
3+2 Machining
Dynamic machine control
Stock models
Process Control

Automation
User-defined macros
Machining templates
Custom toolbars

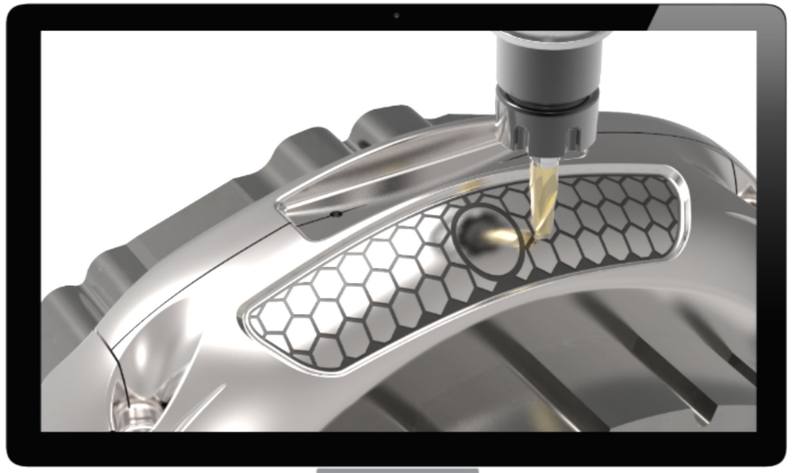
Robotics
Milling/trimming
Linishing/polishing
Additive/Subtractive



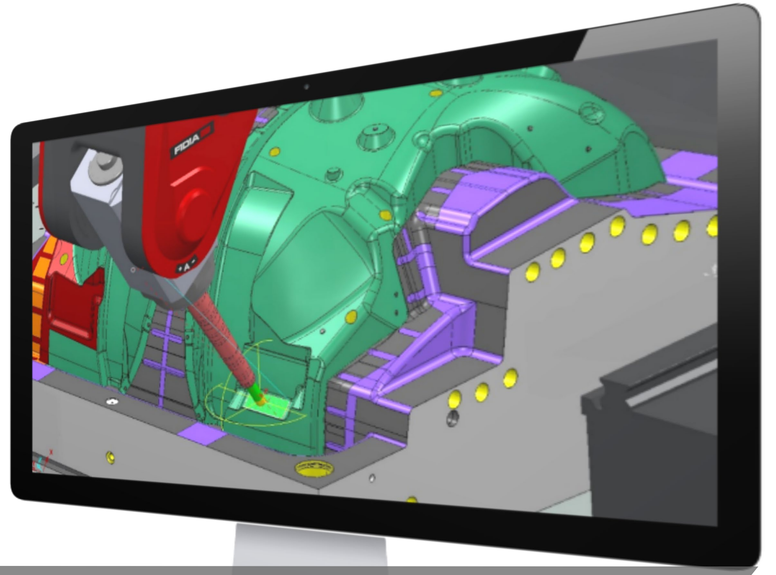
Expert Levels of Control & Optimization



Increased Precision



Excellent Surface Finish Quality



Verification, Collision Checking & Avoidance

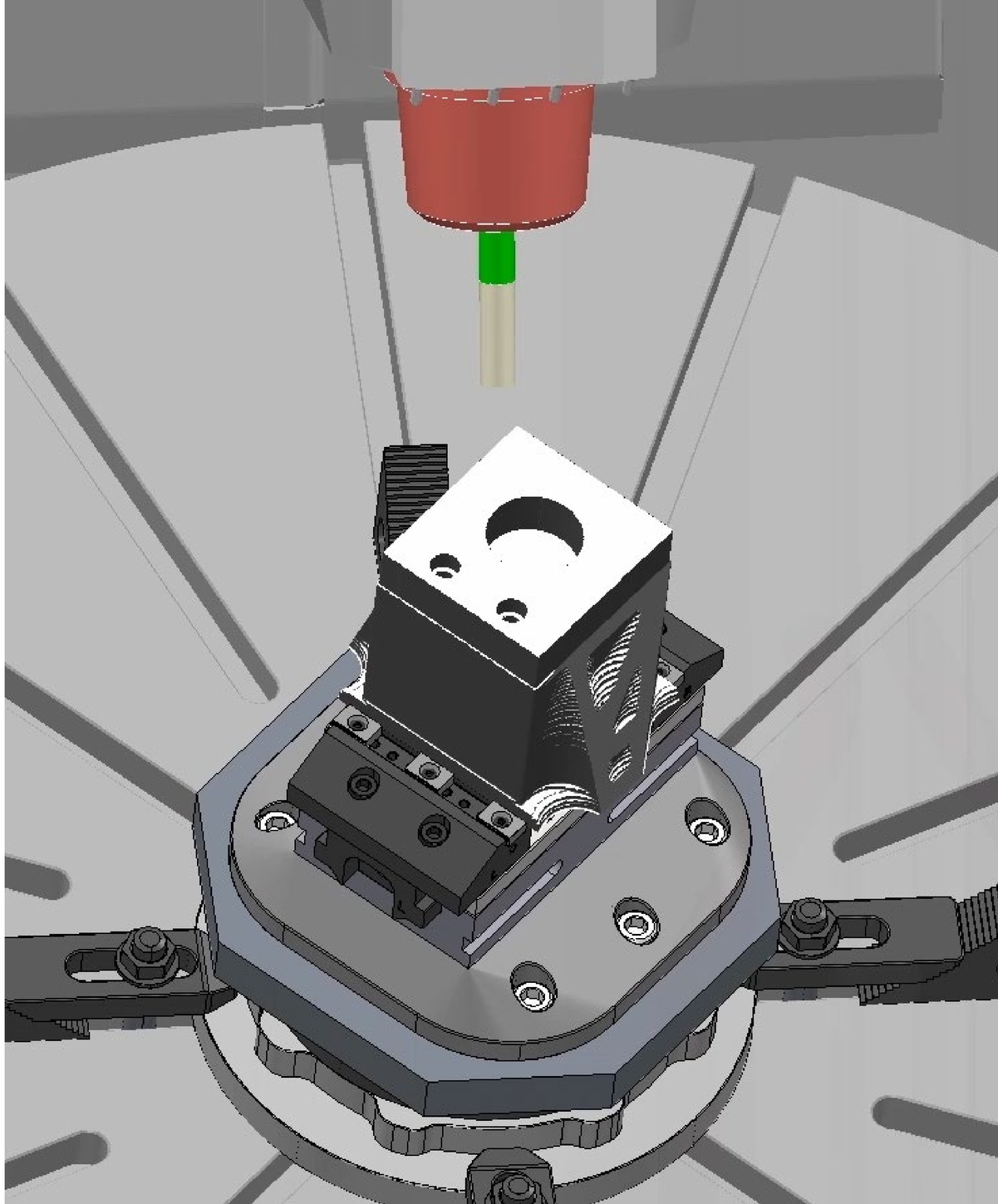
Access to Fusion 360

Do you have Access to Fusion 360?

Manufacturing with PowerMill with Fusion 360

Workflow 1
PowerMill Machine Simulation

- Simulate using virtual stock and machine
  - Embed your virtual machine’s capabilities
- Verify entire projects for collisions or near-misses and identify problems early
  - 5-axis tilting to avoid collisions
  - Use alternative tooling
- Improved safety and program confidence
  - Confirm your part can be machined before it is sent for production
  - Avoid unplanned machine downtime



Workflow 1
AnyCAD in Fusion 360

- Open native CAD files from modelling systems
- Combine into Fusion 360 assemblies
- Analyzed for fit and function
- Link to the original CAD model is maintained
- Fusion 360 brings design teams together
- Manage the design process and collaborate with your team, clients, and partners
- Distributed design functionality allows you to insert one design into multiple designs and maintain the associativity

Autodesk Fusion 360

My Projects

Data | People

Upload | New Folder

master

Raised-Fixture V1

RWP-502 Rev B... V1

RWP-502 Rev B... V1

RWP-502 ...9 v1 v1*

Robert Walker

MODEL | SKETCH | CREATE | MODIFY | ASSEMBLE | CONSTRUCT | INSPECT | INSERT | MAKE | ADD-INS | SELECT

BROWSER

- RWP-502 Rev B - TP v29 v1 v1
  - Document Settings
  - Named Views
  - Origin
  - Joints
    - Planar1
  - Base:1
  - Jaw L:1
  - Jaw R:1
  - Slider L:1
  - Slider R:1
  - Spindle:1
  - Stock:1
  - Talons:1
  - UMC Riser:1
    - Origin
    - UMCRiserBase:1
    - 91251A714:1
    - 91251A714 (3):1
    - 91251A714 (5):1
    - 91251A714 (4):1
    - 91251A714 (2):1
    - 91251A714 (1):1
  - Motor Bracket v1:1
  - Raised-Fixture v1:1

JOINT

Components

Component1: 1 selected

Component2: 1 selected

Alignment

Angle: 0.0 deg

Offset X: 0.00 mm

Offset Y: 0.00 mm

Offset Z: 0.00 mm

Flip

Motion

Type: Cylindrical

Normal: Z Axis

Animate

OK | Cancel

COMMENTS

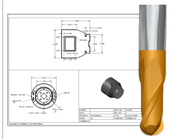
1 Face | Radius : 6.668 mm

Workflow 2
PowerMill for Tool & Die

- Algorithms optimized for large, complex parts
  - Stock management to minimize air cutting
- Machine parts faster, using fewer setups, shorter tools and more aggressive milling
- Dynamically orientate CNC machine's rotary axes without the need for complete re-calculation
  - Make global or localized changes to tool axes
  - Trim, divide, reverse and reorder toolpaths
- Optimize non-cutting moves to avoid dwell marks and minimize air cutting
  - Use analysis tools to identify and improve hazardous motion

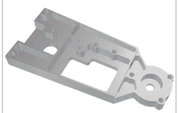
Product Overlaps vs Specialist Capabilities

	Integrated Advanced CAD	Waterjet & Laser Cutting	Multi-Spindle Turning	Mill-Turn & Turn-Mill	Basic 2-Axis Turning	Probing	2D/2.5D Milling	3-Axis Milling	3+2 & Basic Multi-Axis Milling	Complex Multi-Axis Milling	Tool Axis Editing	Toolpath Editing	Specialist Strategies & Robotics
AUTODESK® FUSION 360™	■	■	■	■	■	■	■	■	■				
AUTODESK® POWERMILL®				■	■	■	■	■	■	■	■	■	■



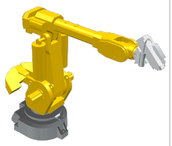










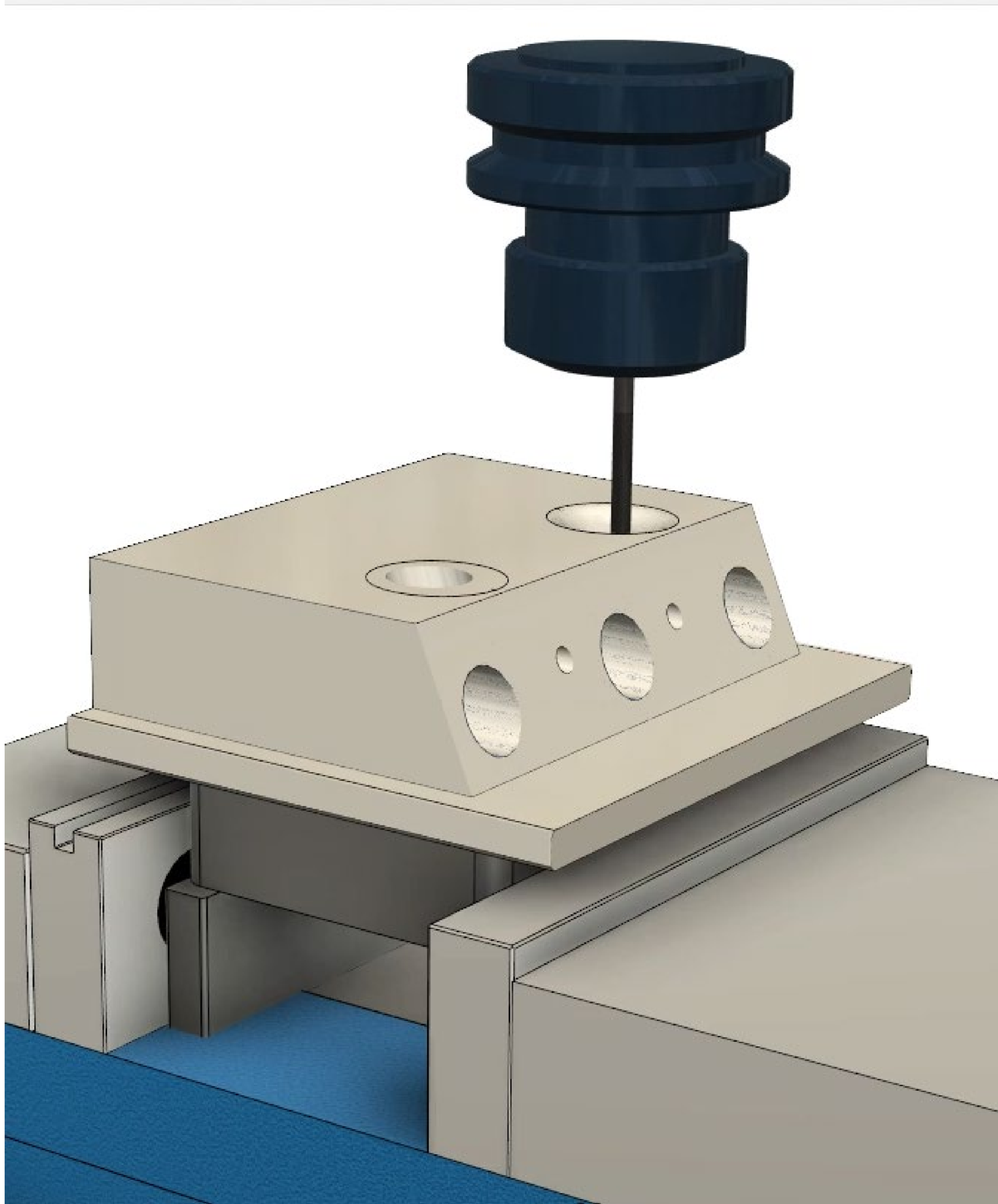


Workflow 2
Additional CAM Capacity

- Machine core and cavity with PowerMill
- Tackle ancillary components with

  Fusion 360
- Separate mold tool into components
- Machine ancillary components using

  Fusion 360



Autodesk Fusion 360

SawMold-FixedHalf v17*

Spencer Hardcastle

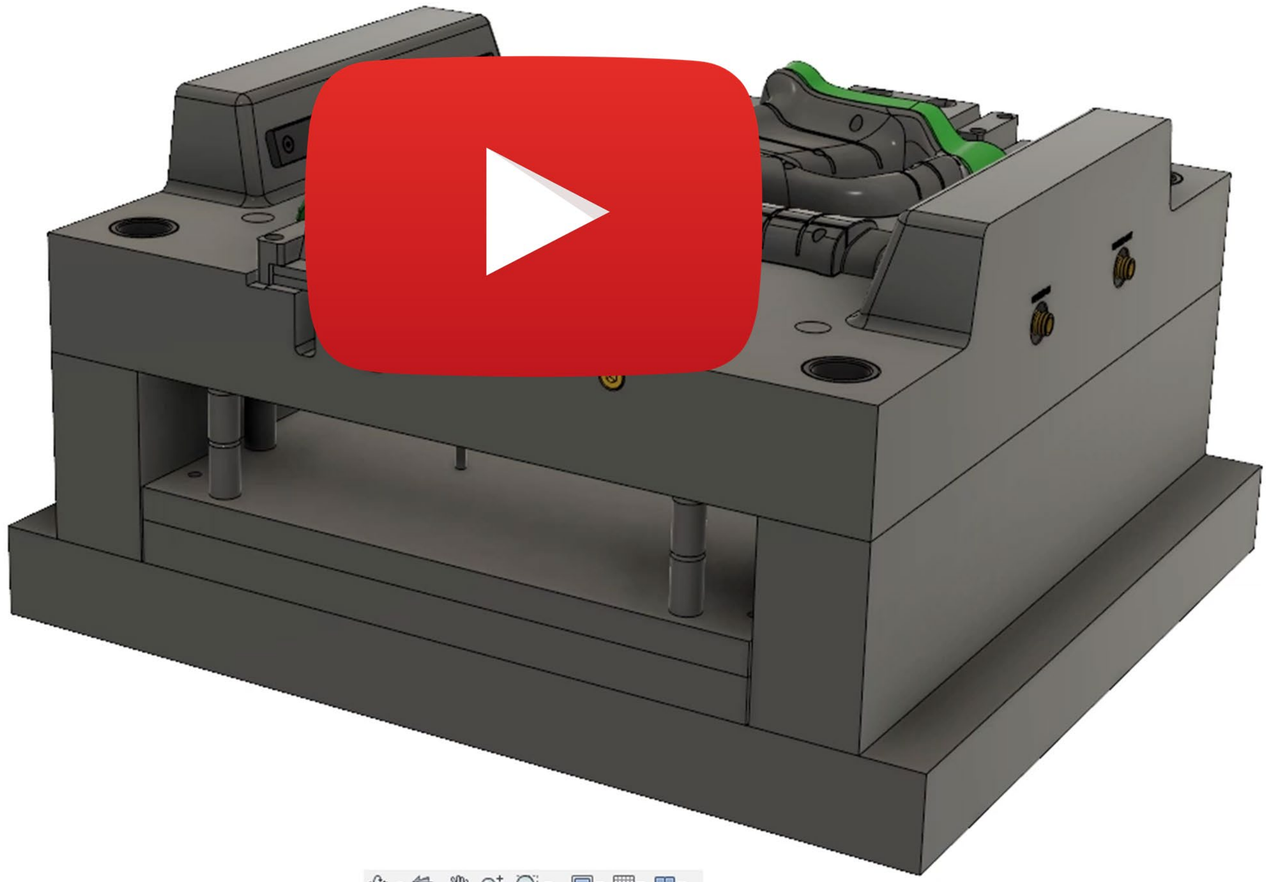
DESIGN

SOLID | SURFACE | FORM | MESH | TOOLS

CREATE | MODIFY | ASSEMBLE | CONSTRUCT | INSPECT | INSERT | SELECT

BROWSER

- SawMold-FixedHalf v17
  - Document Settings
  - Named Views
  - Selection Sets
  - Origin
  - Bodies
  - Component1:1
  - Component2:1
  - SRM-4C4GD1 v1:1
  - SRM-4C4GD1 v1:2
  - SRM-4C4GD1 v1:3
  - SRM-4C4GD1 v1:4
  - SRM-4C4GD1 v1:5
  - SRM-4C4GD1 v1:6
  - SRM-4C4GD1 v1:7
  - SRM-4C4GD1 v1:8
  - SawMold-MovingHalf v4:1
  - FusionSaw-Part v1:1

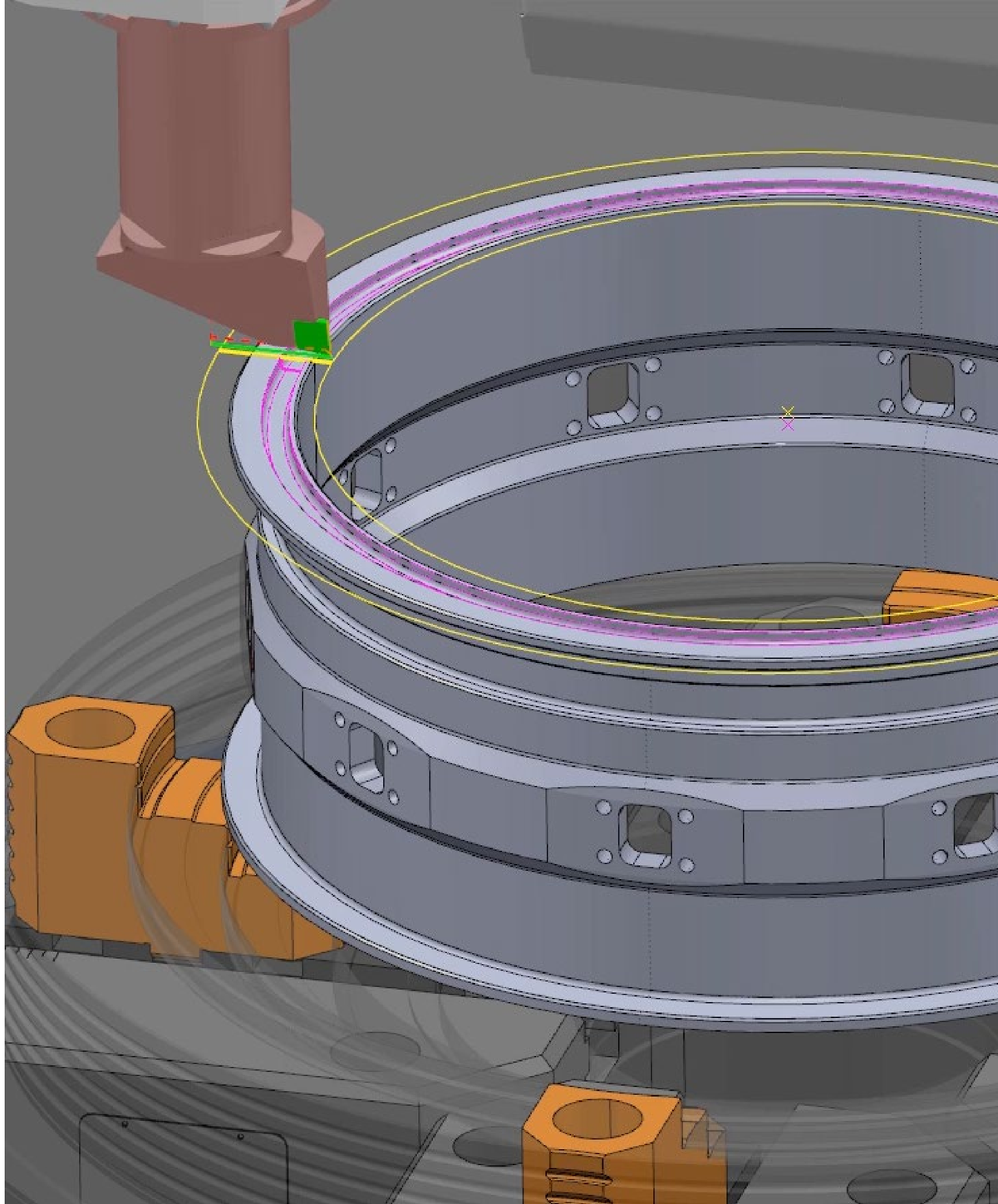


COMMENTS

TEXT COMMANDS

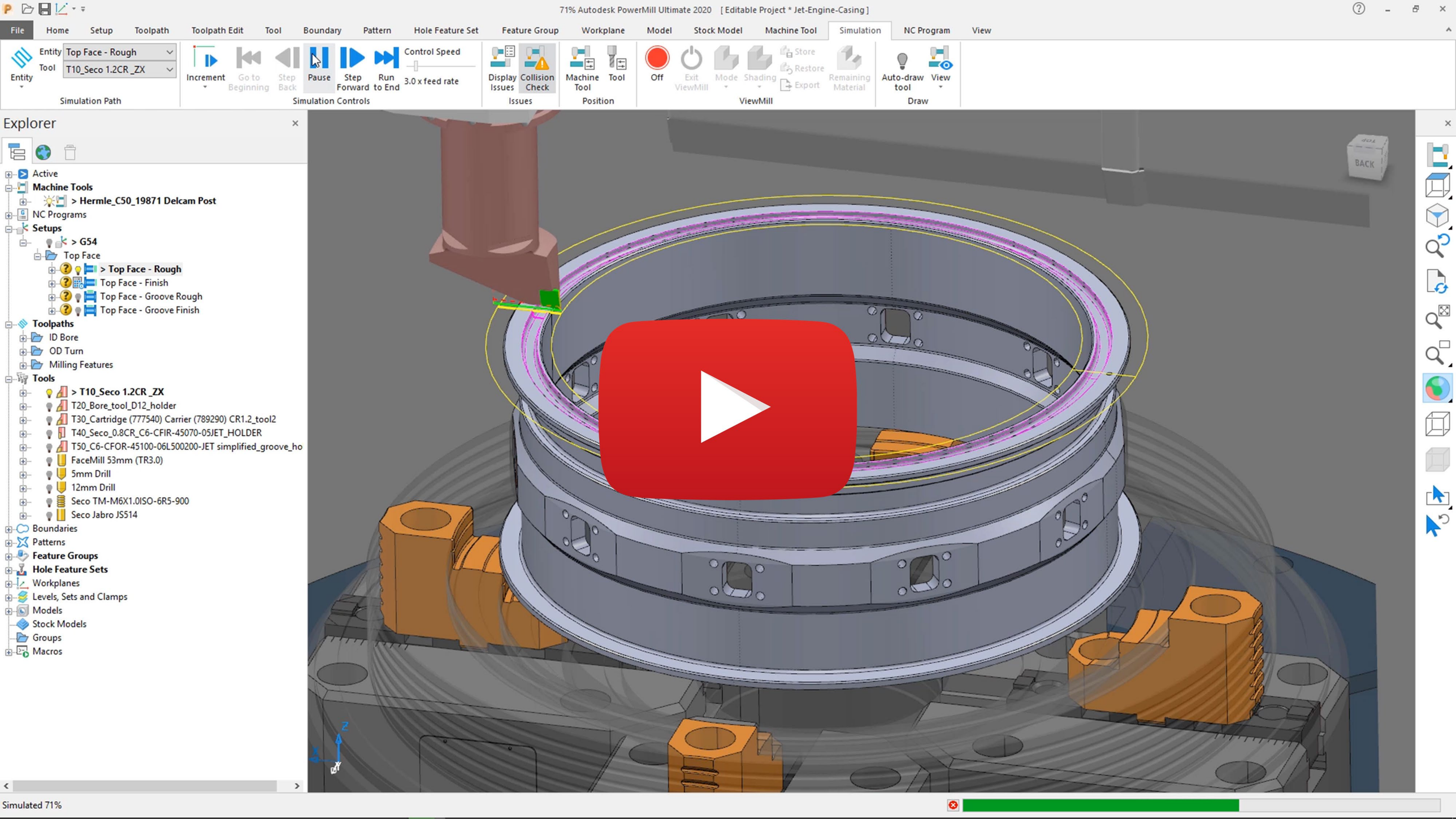
Workflow 3
Accurate Tools in PowerMill

- Supports asymmetric geometry of Turning Tools for accurate simulation
- Utilize STL models
- Full control of turning tool orientation, with a single tool instance



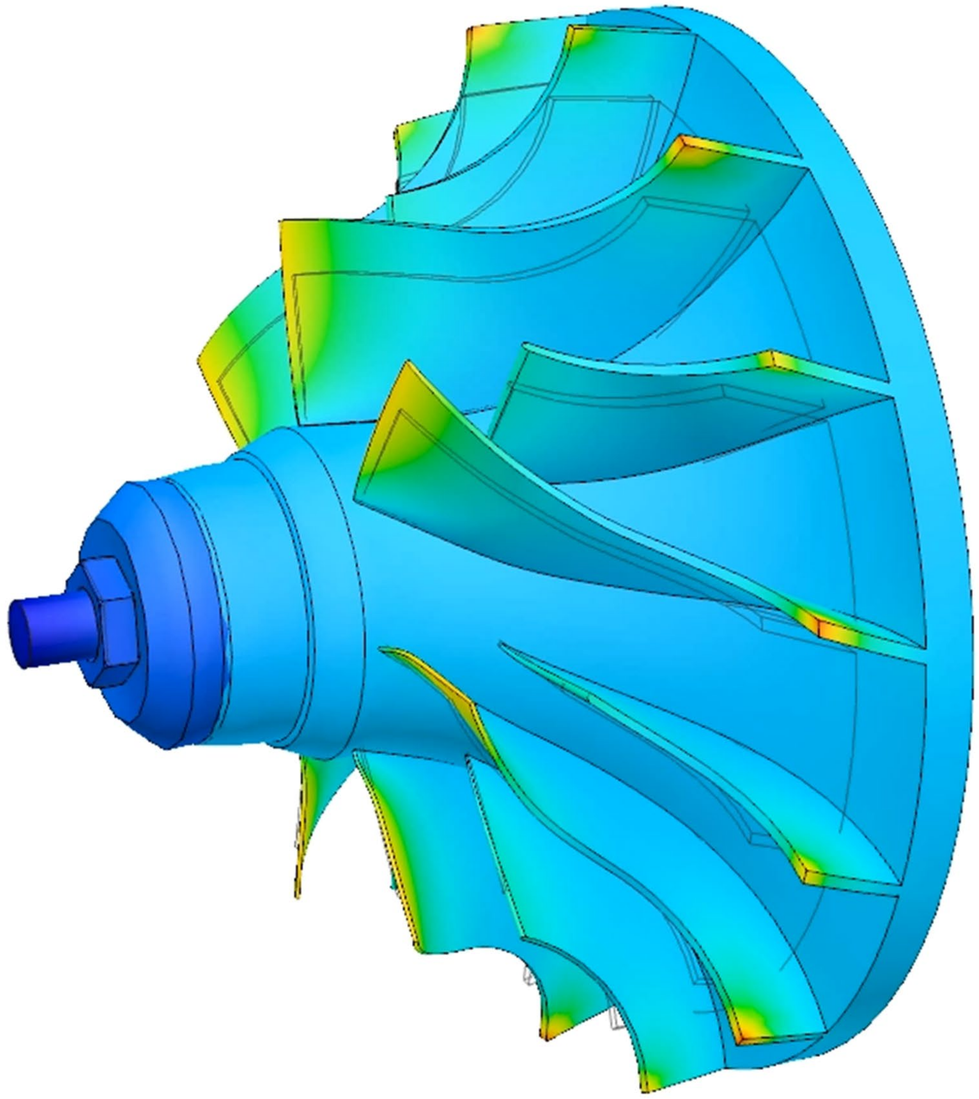
Workflow 3
Design in Fusion 360

- Constraint-based sketching
- Quick and intuitive 3D parametric modelling
- Capture design history
  - Including direct modelling actions
- Export STL files


71% Autodesk PowerMill Ultimate 2020 [Editable Project * Jet-Engine-Casing]
File
Home
Setup
Toolpath
Toolpath Edit
Tool
Boundary
Pattern
Hole Feature Set
Feature Group
Workplane
Model
Stock Model
Machine Tool
Simulation
NC Program
View
Entity
Top Face - Rough
Tool
T10_Seco 1.2CR _ZX
Simulation Path
Increment
Go to Beginning
Step Back
Pause
Step Forward
Run to End
Control Speed
3.0 x feed rate
Simulation Controls
Display Issues
Collision Check
Issues
Machine Tool
Tool
Position
Off
Exit ViewMill
Mode
Shading
Store
Restore
Export
Remaining Material
ViewMill
Auto-draw tool
View
Draw
Explorer
Active
Machine Tools
> Hermle_C50_19871 Delcam Post
NC Programs
Setups
> G54
Top Face
> Top Face - Rough
Top Face - Finish
Top Face - Groove Rough
Top Face - Groove Finish
Toolpaths
ID Bore
OD Turn
Milling Features
Tools
> T10_Seco 1.2CR _ZX
T20_Bore_tool_D12_holder
T30_Cartridge (777540) Carrier (789290) CR1.2_tool2
T40_Seco_0.8CR_C6-CFIR-45070-05JET_HOLDER
T50_C6-CFOR-45100-06L500200-JET simplified_groove_ho
FaceMill 53mm (TR3.0)
5mm Drill
12mm Drill
Seco TM-M6X1.0ISO-6R5-900
Seco Jabro JS514
Boundaries
Patterns
Feature Groups
Hole Feature Sets
Workplanes
Levels, Sets and Clamps
Models
Stock Models
Groups
Macros
BACK
Simulated 71%

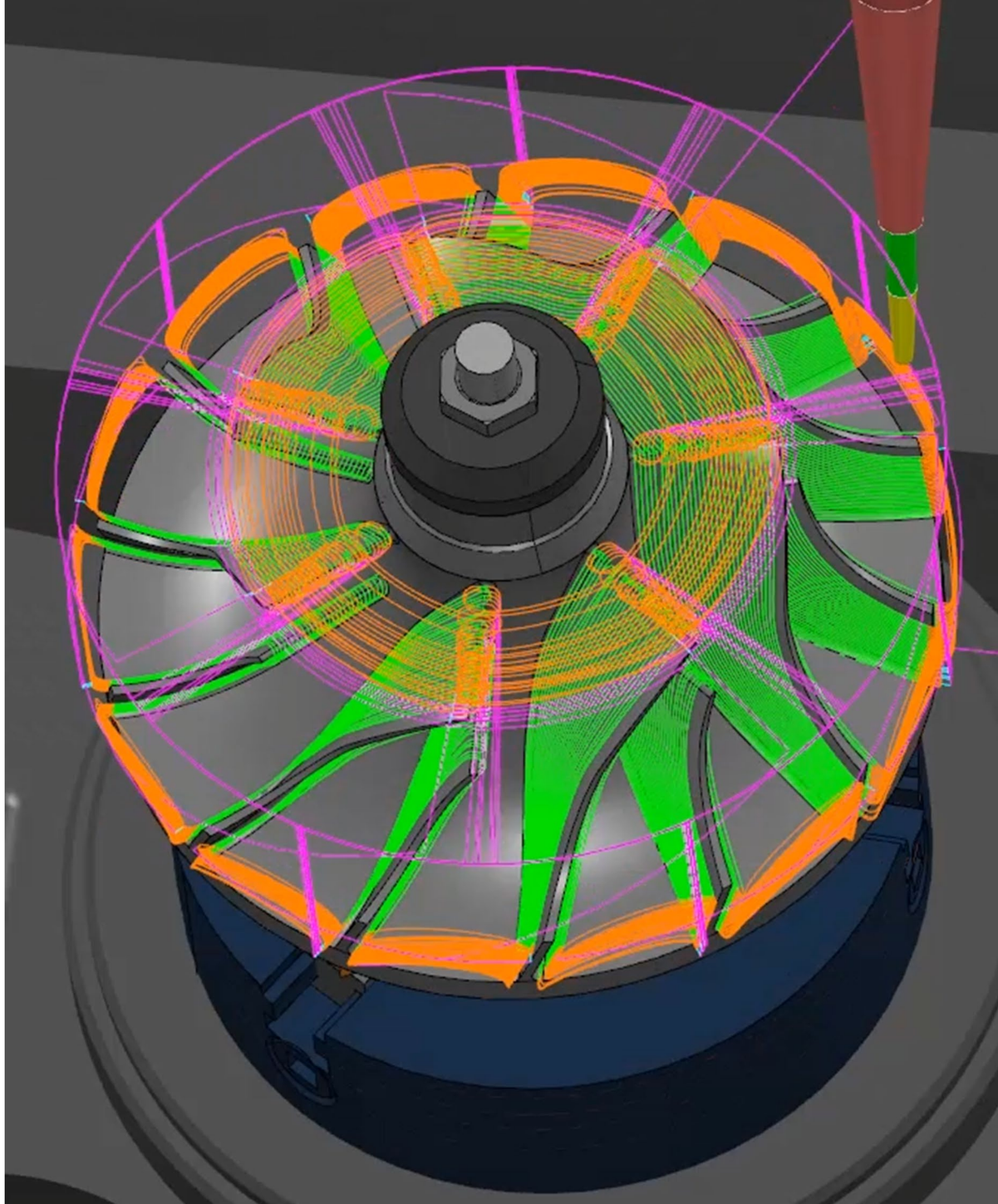
Workflow 4
Thermal Simulation in Fusion 360

- Determine steady-state temperature distribution and the resultant heat flows
- Steady-state heat transfer analysis, to determine
  - Temperature distribution
  - Heat flow
- Avoid part failure by simulating maximum critical temperature
- Help understand and control the heat flow of larger designs



Workflow 4
Specialized Strategies

- Machine blades, blisks, impellers and vanes
- Specialized 5-axis toolpaths with optimized motion around leading and trailing edges
- Combine with tip-radiused tools and controlled point spacing for extreme levels of surface finish
- Dedicated roughing and finishing strategies for ultra-efficient machining
- Advanced control of toolpath offsets and tool axis motion with intelligent collision avoidance



SD-57-Turbocharger v4*

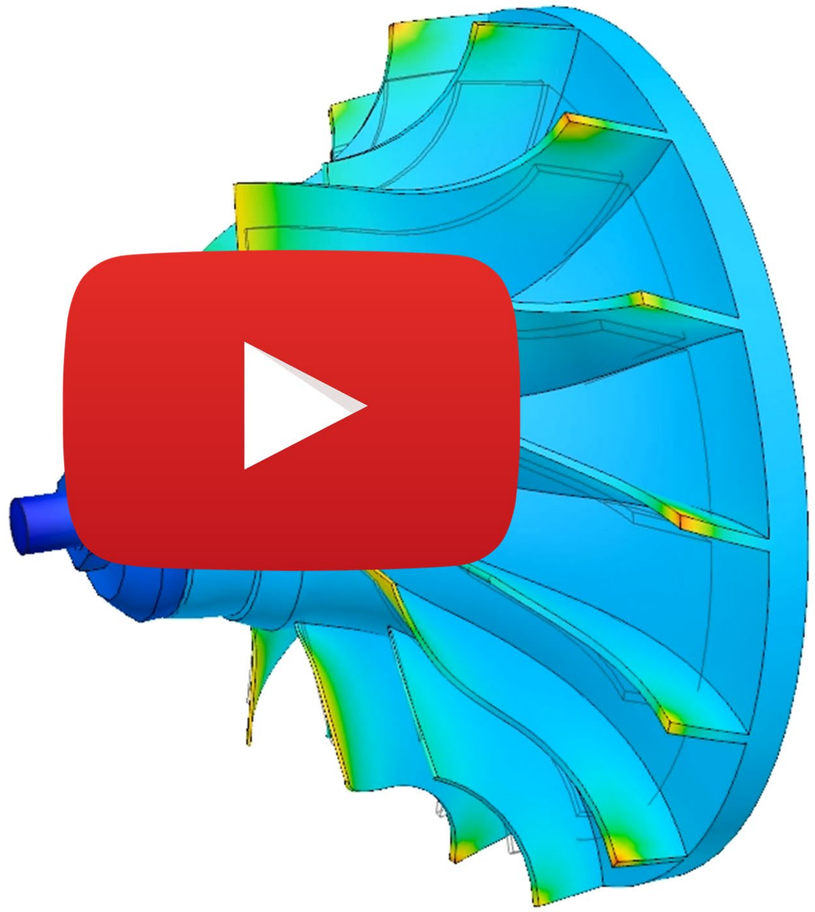
Aaron Magnin

SETUP RESULTS

SIMULATION | STUDY | SIMPLIFY | MATERIALS | CONSTRAINTS | LOADS | CONTACTS | DISPLAY | SOLVE | MANAGE | INSPECT | SELECT

BROWSER

- Simulations
  - Units: Custom
  - Simulation Model 1
    - Named Views
    - Origin
    - Model Components
    - Study 1 – Thermal Stress
      - Study Materials
      - Load Case1
        - Loads
        - Constraints
        - Contacts
        - Mesh
        - Results
    - Study 2 – Thermal Stress



Load Case1
Temperature
C

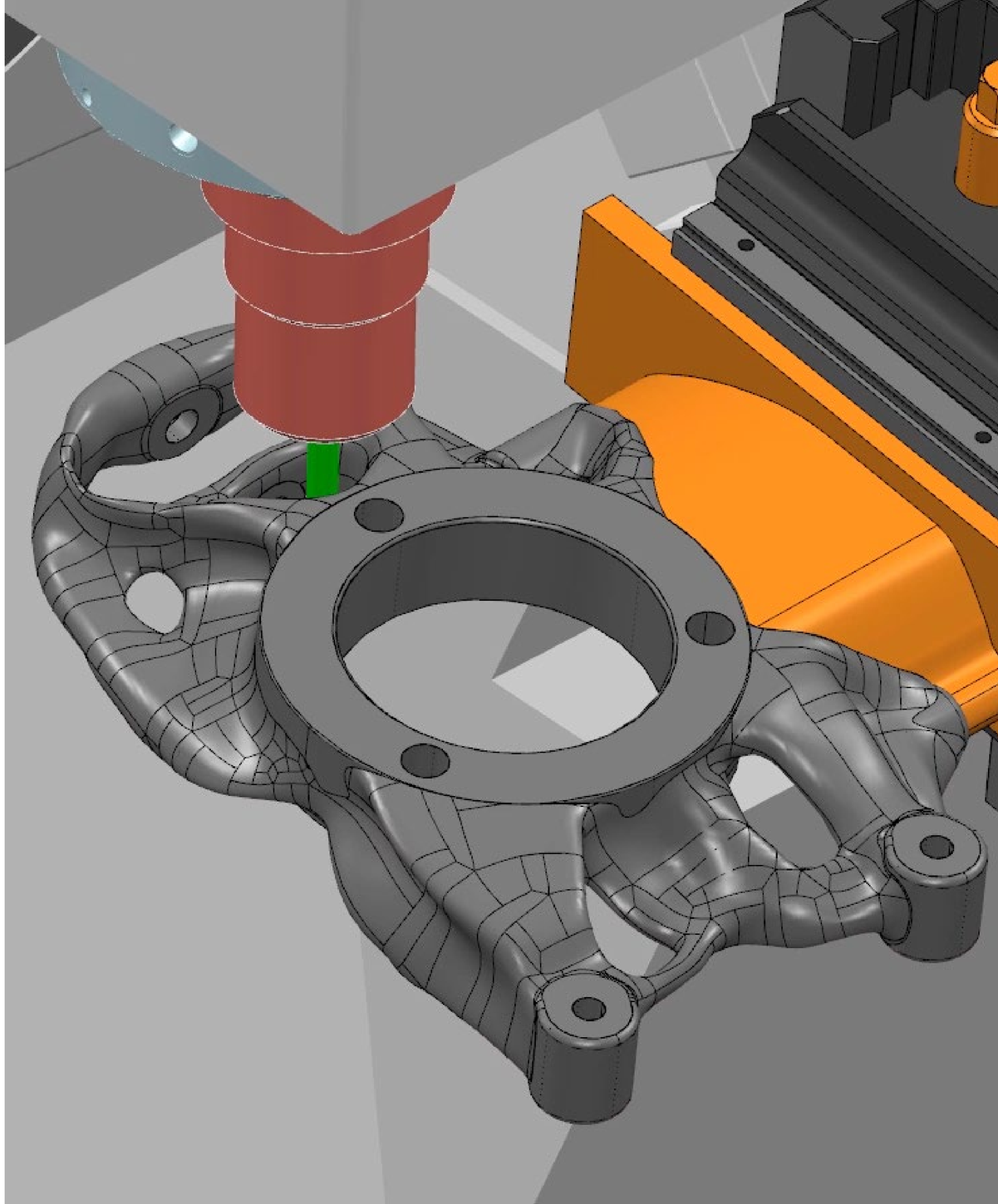
689.9 Max.
652.8
615.7
578.5
541.4
504.3 Min.

COMMENTS

2 Component Instances

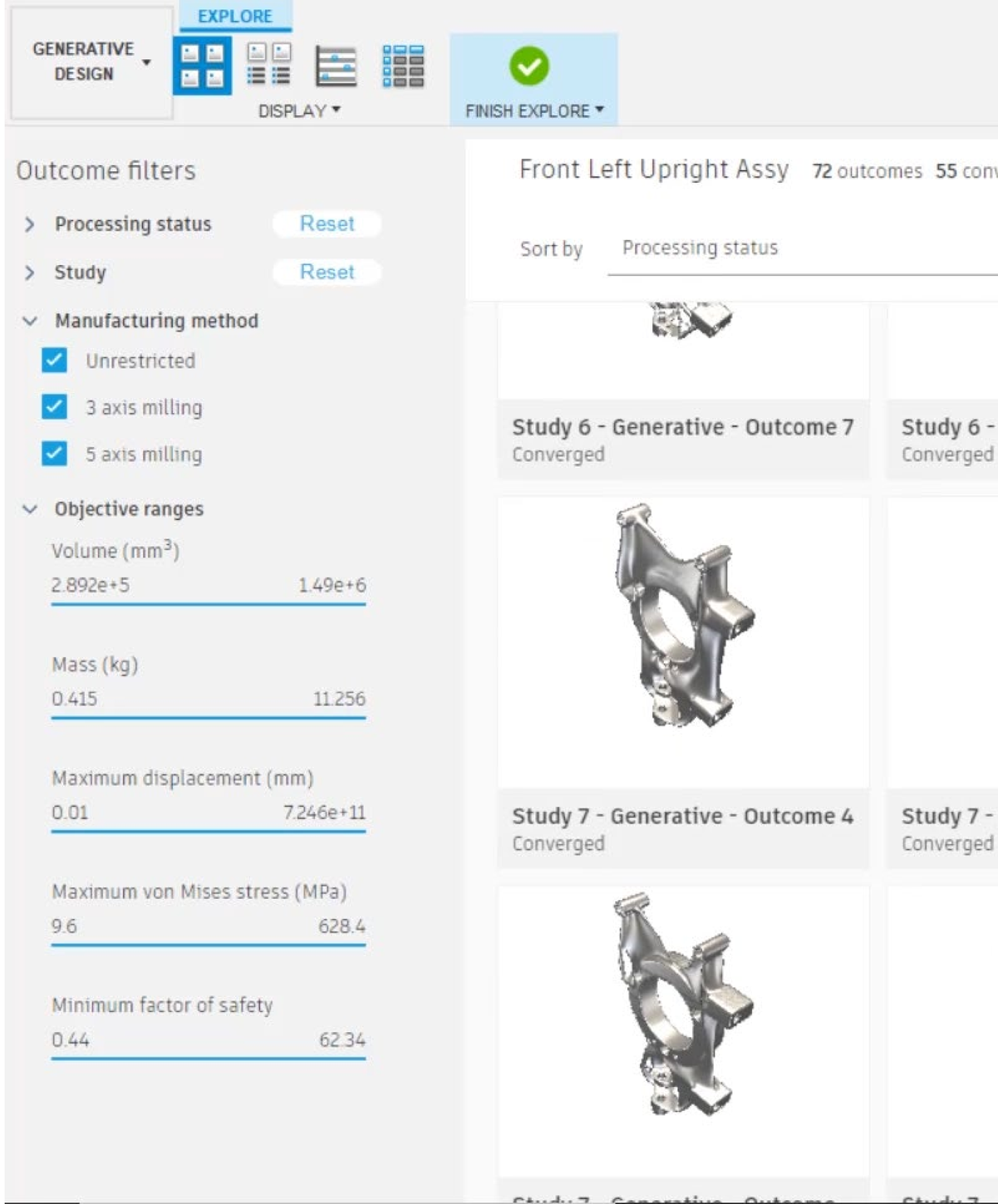
Workflow 5
Machine Complex Geometry

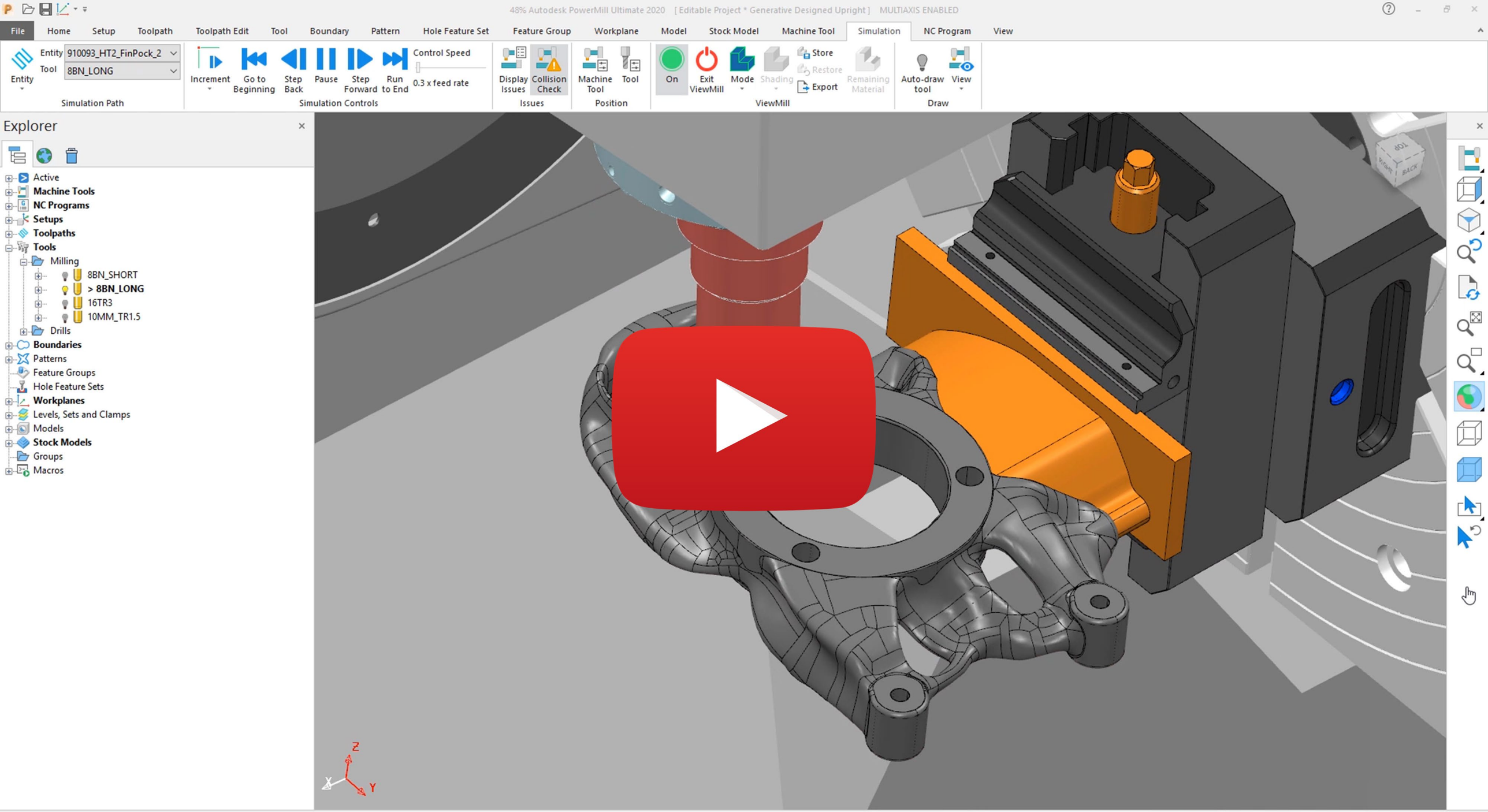
- Vast library of comprehensive finishing strategies to machine complex parts
  - Greater choice
  - Flexibility
  - Control
- Advanced tool axis control, with full collision avoidance



Workflow 5
Generative Design

- Generative Design mimics nature's evolutionary approach to design
- Starts with the problem statement, to minimise design iterations such as functional requirements, material type, manufacturing method and performance criteria
- Evaluates and presents a number of generated designs that satisfy requirements
- Each potential solution contains performance data
- Evaluate generated solutions in real time, returning to the problem definition to adjust goals and constraints
- Output design for minor design modifications




48% Autodesk PowerMill Ultimate 2020 [Editable Project * Generative Designed Upright] MULTIAXIS ENABLED
File
Home
Setup
Toolpath
Toolpath Edit
Tool
Boundary
Pattern
Hole Feature Set
Feature Group
Workplane
Model
Stock Model
Machine Tool
Simulation
NC Program
View
Entity
910093_HT2_FinPock_2
Tool
8BN_LONG
Simulation Path
Increment
Go to Beginning
Step Back
Pause
Step Forward
Run to End
Control Speed
0.3 x feed rate
Simulation Controls
Display Issues
Collision Check
Issues
Machine Tool
Tool
Position
On
Exit ViewMill
Mode
Shading
Store
Restore
Export
Remaining Material
ViewMill
Auto-draw tool
View
Draw
Explorer
Active
Machine Tools
NC Programs
Setups
Toolpaths
Tools
Milling
8BN_SHORT
> 8BN_LONG
16TR3
10MM_TR1.5
Drills
Boundaries
Patterns
Feature Groups
Hole Feature Sets
Workplanes
Levels, Sets and Clamps
Models
Stock Models
Groups
Macros
Z
X
Y
Simulated 48%

Want to learn more about PowerMill?

“Creating the Longest 3D-Concrete-Printed Bridge in the World: A BAM Story”

Industry Talk delivered by Alexander Keil

Tomorrow at 2:45pm - CS324996

Want to learn more about Fusion 360?

“From Part to Post – Complex Mold Manufacture Using Fusion 360”

Hands-on lab delivered by Guy Buttle

Tomorrow at 8:30am – MFG321609-L

Summary

Summary

- Understood what Fusion 360 is and it’s capabilities
  - AnyCAD
  - Fusion Team
- Understood what PowerMill is and it’s capabilities
  - Mold & Die
  - Specialized Finishing Strategies
- Understood how both products work together to provide a comprehensive solution to your design and manufacturing needs

“There ain't no hill or mountain we can't climb”

I GOT YOU BABE – SONNY AND CHER

Any Questions?

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