



Future of Making

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A photograph of a very dense crowd of people walking down a city street. In the background, a tram is visible on the street. The scene is brightly lit, suggesting daytime. The text '10 BILLION' is overlaid in large white letters across the center of the image.

10 BILLION



BUSINESSES ARE FACING PRESSURE TO KEEP UP WITH A RAPIDLY EVOLVING MARKET



An aerial photograph of a city, likely Bangkok, showing a dense urban landscape. In the foreground, a multi-lane highway with an overpass is filled with traffic, including cars, vans, and motorcycles. Below the highway, there are various commercial buildings and shops, some with signs in Thai. The middle ground is filled with a mix of older, lower-rise buildings and newer, taller structures. In the background, a prominent skyline of modern skyscrapers is visible under a clear blue sky with some light clouds. The overall scene depicts a rapidly growing and densely populated urban area.

MORE
IS INEVITABLE



An aerial photograph of a massive open-pit mine. The landscape is a complex of dark, layered earth and rock, with numerous tracks and paths crisscrossing the terrain. Several large yellow and blue mining vehicles, including haul trucks and excavators, are visible at different levels of the mine. Pools of water are scattered throughout the site, reflecting the overcast sky. The overall scene conveys a sense of intense industrial activity and large-scale earthmoving.

LESS
IS A REALITY



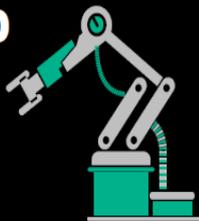
A photograph of an industrial factory setting. Two large, white robotic arms are positioned in the foreground, engaged in a welding process. Bright sparks are flying from the point where the robots meet, creating a dynamic and energetic scene. The background shows the complex metal structure of the factory, with various beams and pipes. The lighting is somewhat dim, with a blueish tint, emphasizing the industrial atmosphere. The text 'BETTER' is overlaid in large, white, sans-serif capital letters across the center of the image.

BETTER

is the OPPORTUNITY

CONVERGENCE AND DISRUPTION IN MANUFACTURING

How Companies are winning market share



The pace and scale of change across high-tech manufacturing is a once-in-a-century transformation. The resulting convergence and disruption—affecting every corner of the manufacturing sector—is profoundly, permanently altering the industrial landscape. The old rules are changing: New competitors are emerging, consumer expectations are shifting, and market share is up for grabs.

EVOLVE OR RISK IRRELEVANCE

There will be winners and losers. We'll see fewer manufacturers, but those that win out will earn greater profits.

Since 2000,

50% of Fortune 500-listed companies have either gone bankrupt, been acquired, or ceased to exist.¹



The changing nature of products is disrupting value chains, forcing companies to rethink and retool nearly everything they do internally.

- Harvard Business Review

“ Manufacturing can no longer be considered separate from the value chain, the system of research and development, product design, software development and integration, and lifecycle service activities performed to deliver a product or service to market.² ”



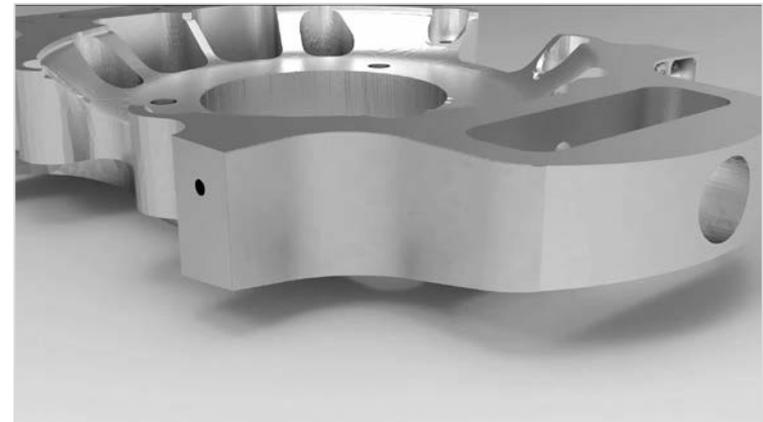
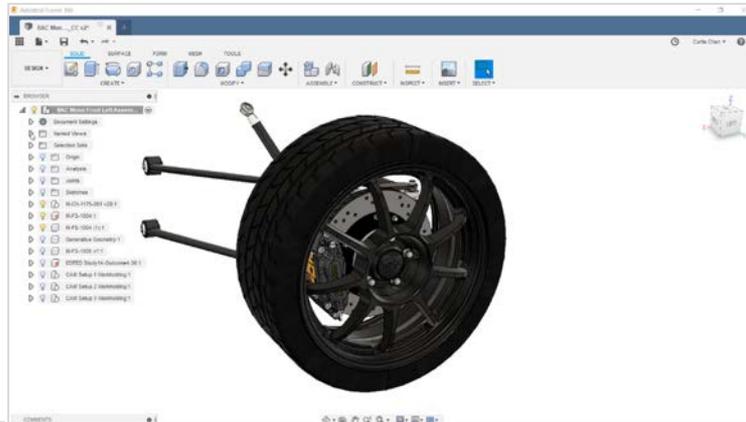
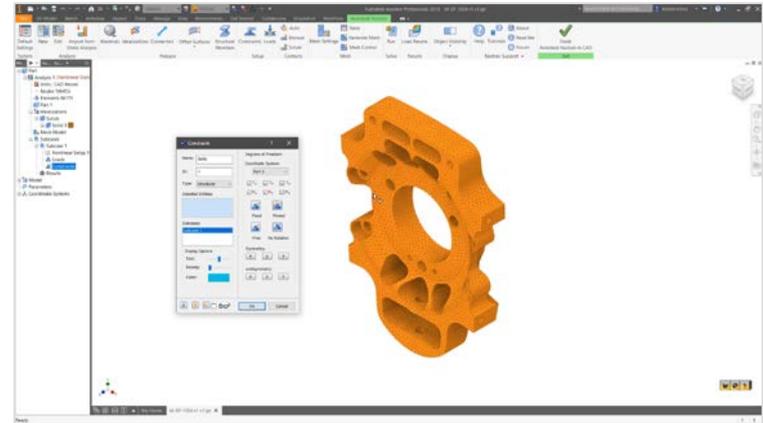
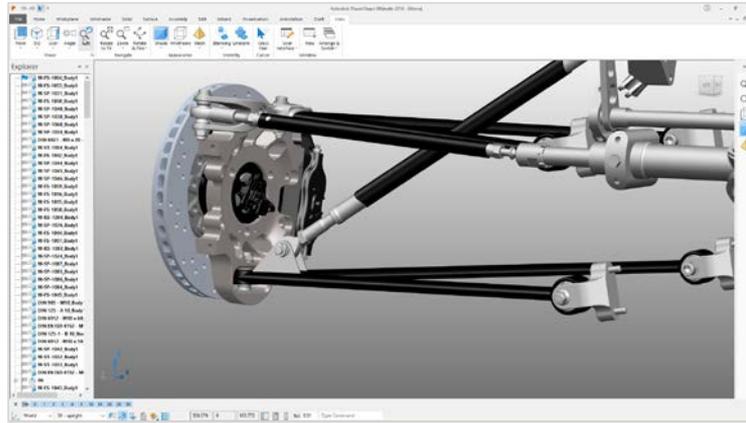
Source: Booz Allen Hamilton report on Convergence and Disruption in Manufacturing, Published in LinkedIn *Engineering*, Aug 19th, 2015



CONVERGENCE OF DESIGN & MANUFACTURING



What are the options?





Parts

- (100%) M-SP-1004 v1 v1
- Part Repair

Slices

Structure Library

Clip planes

X: < -101.95 mm >

Y: < -151.44 mm >

Z: < -44.12 mm >

Transparent Cuts

Status Actions Repair Scripts Shells View

Statistics

Edges:	31527	Border Edges:	0
Triangles:	21018	Inv. Orientation:	0
Shells:	1	Holes:	0

Update Auto-Update

Visualization

Highlight Holes Triangle Mesh

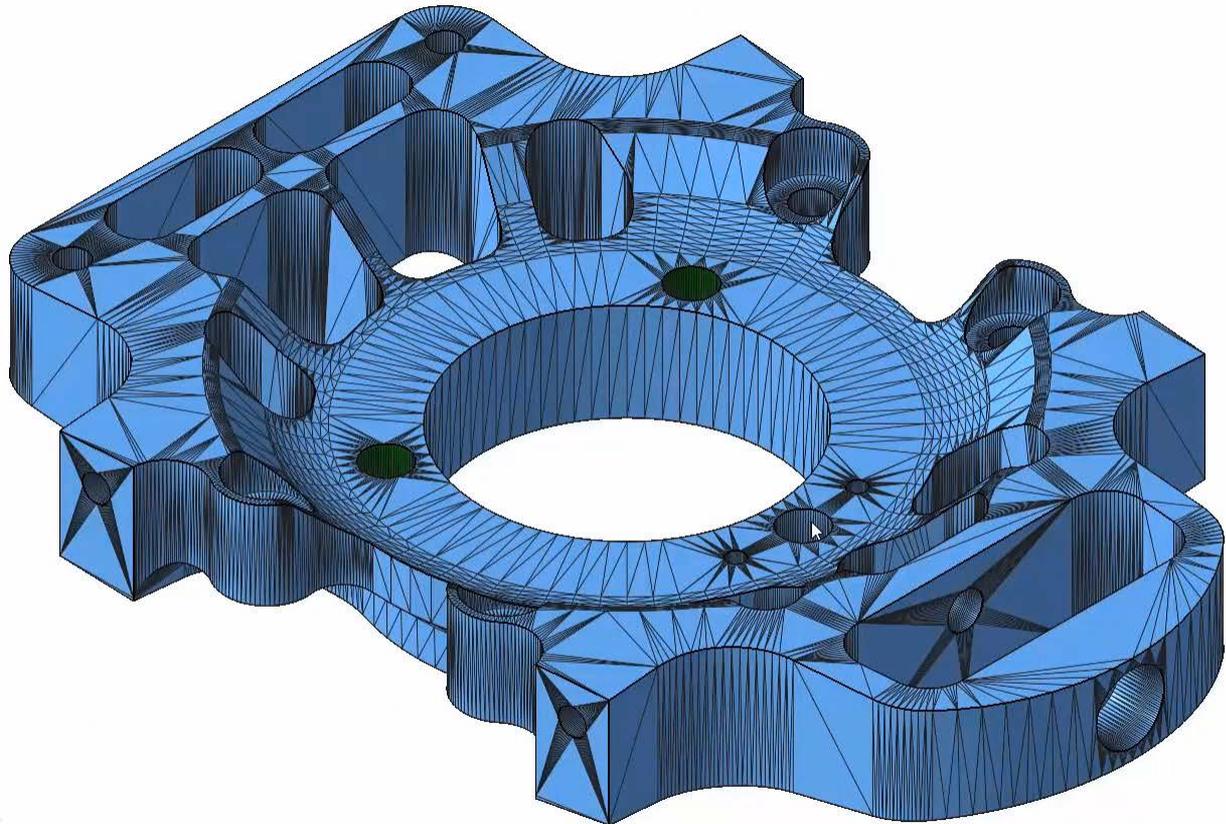
Show Edges from: 45°

Show Degenerated Faces

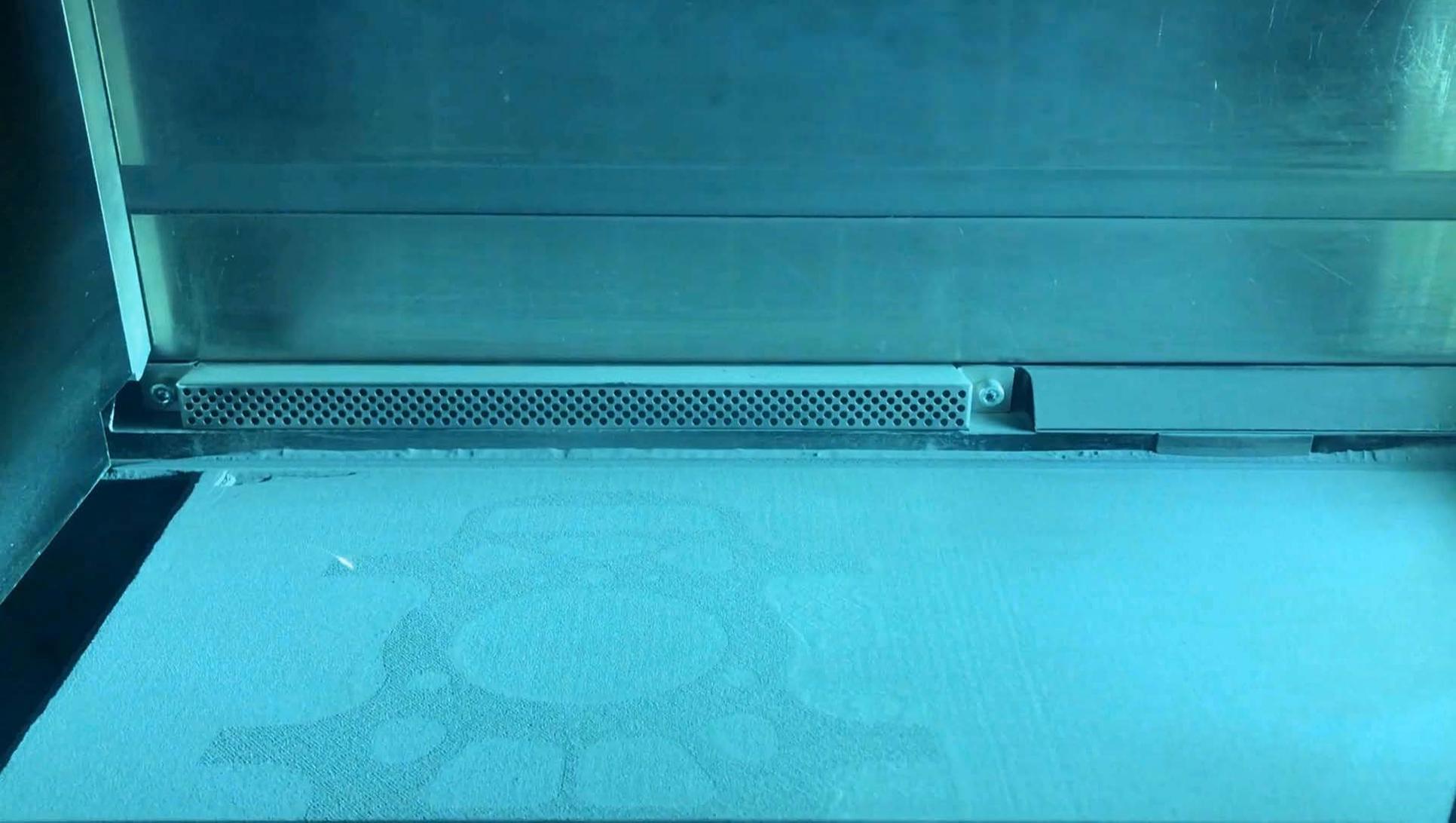
Highlight Errors

Surface Selection

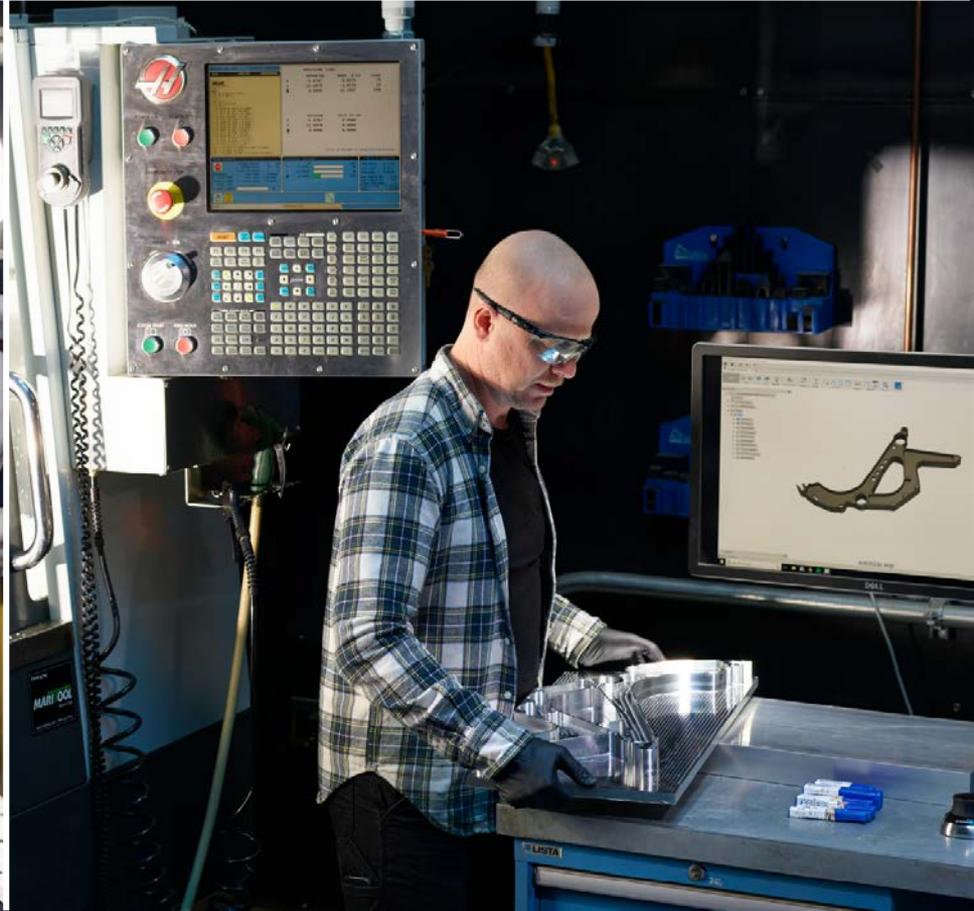
Tolerance: 90°

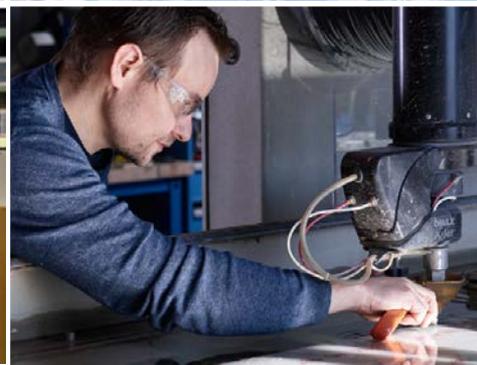
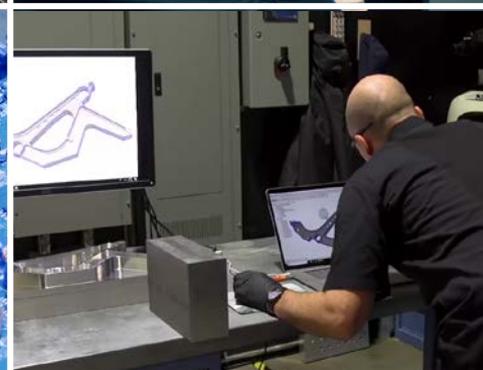
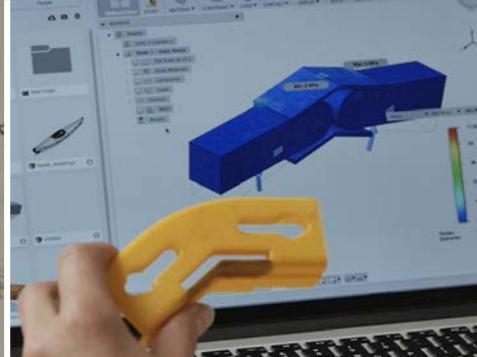
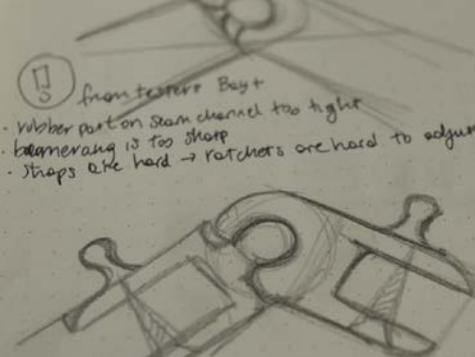


Apply Repair Automatic Repair



THE FUTURE OF MAKING





Fusion 360 | Integrated CAD, CAE, and CAM

Convergence of design, engineering, and manufacturing into a single platform

Design

Iterate on design ideas with generative design and sculpting tools to explore form, and with modelling tools to create finishing features

Original design by Zaha Hadid, Fusion 360 model by Jake Fowler

Engineer &
Simulate

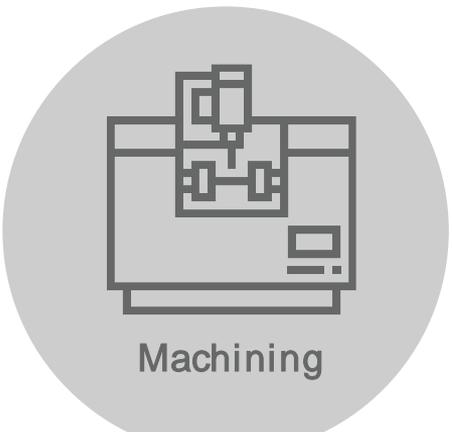
Test fit and motion, perform simulations, create assemblies, make photorealistic renderings and animations

CAM

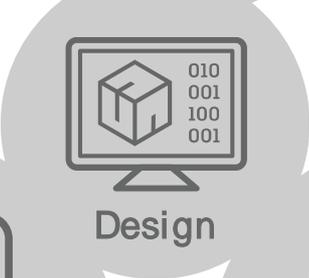
Create toolpaths to machine your components or use the 3D printing workflow to create a prototype

Collaborate

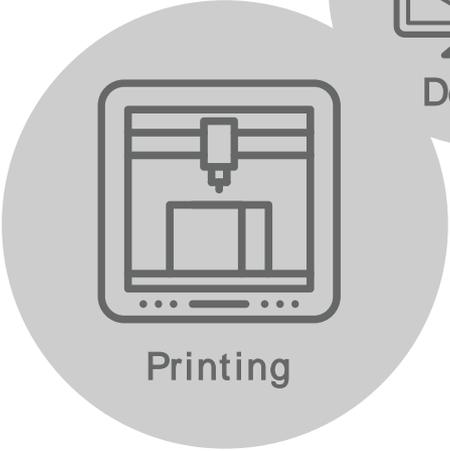
MANUFACTURING LED DESIGN



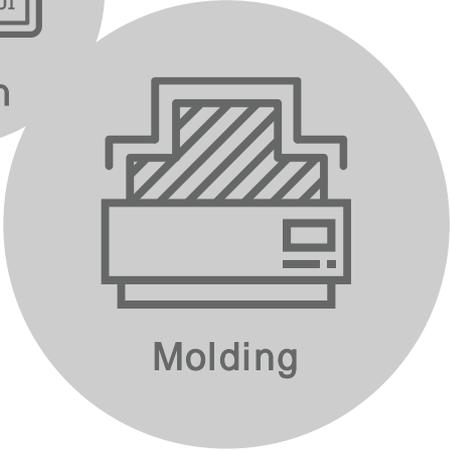
Machining



Design



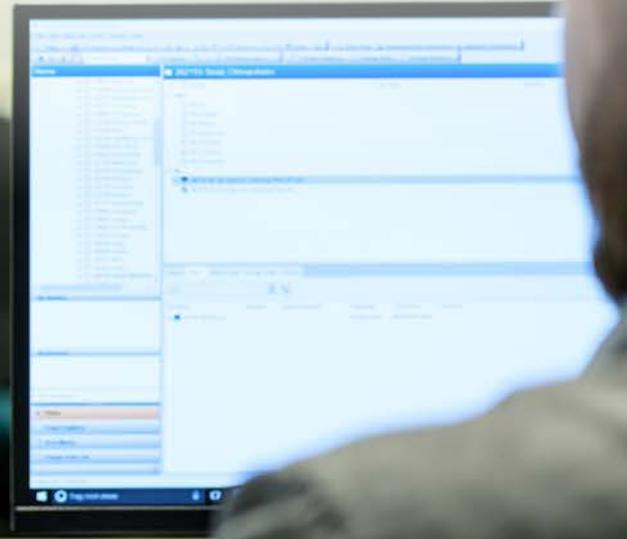
Printing



Molding

Generative Design

Algorithmic exploration of design to make



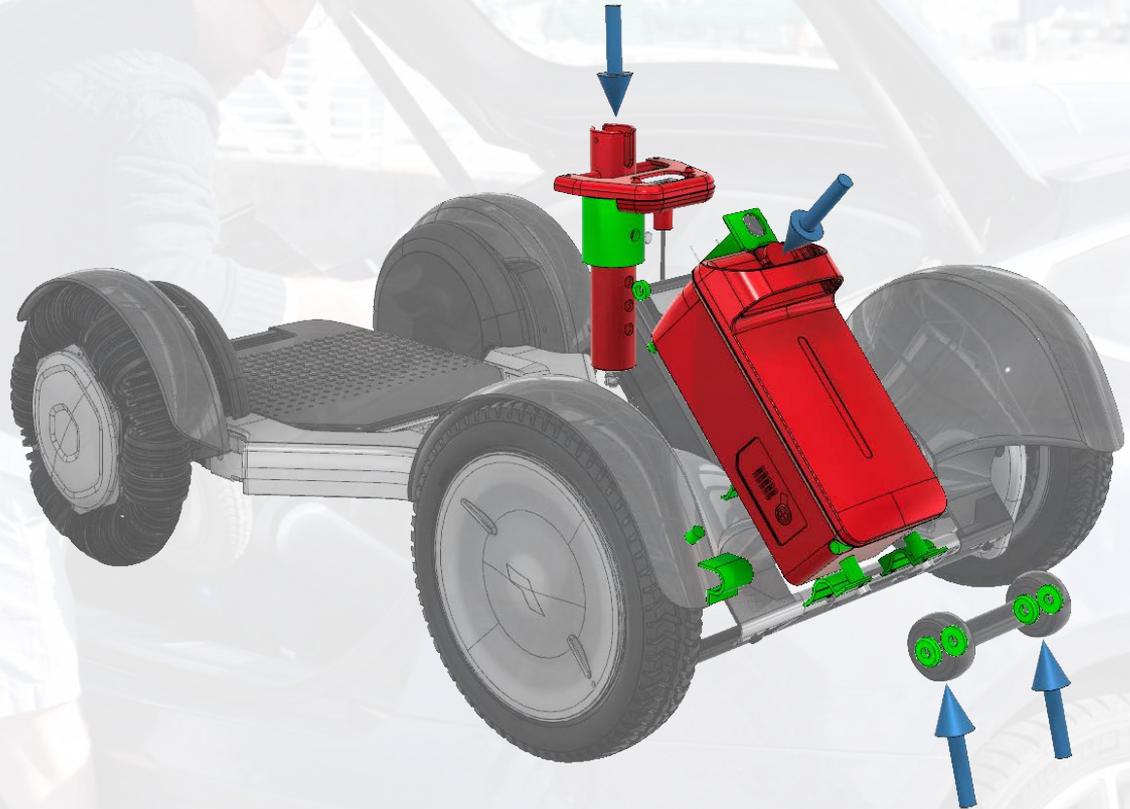
Generative Design

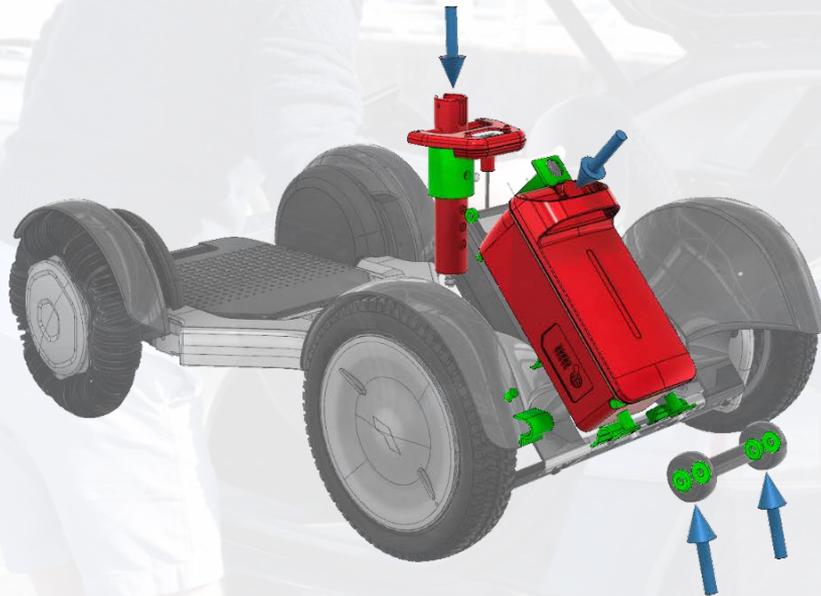




< 15 Kg







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

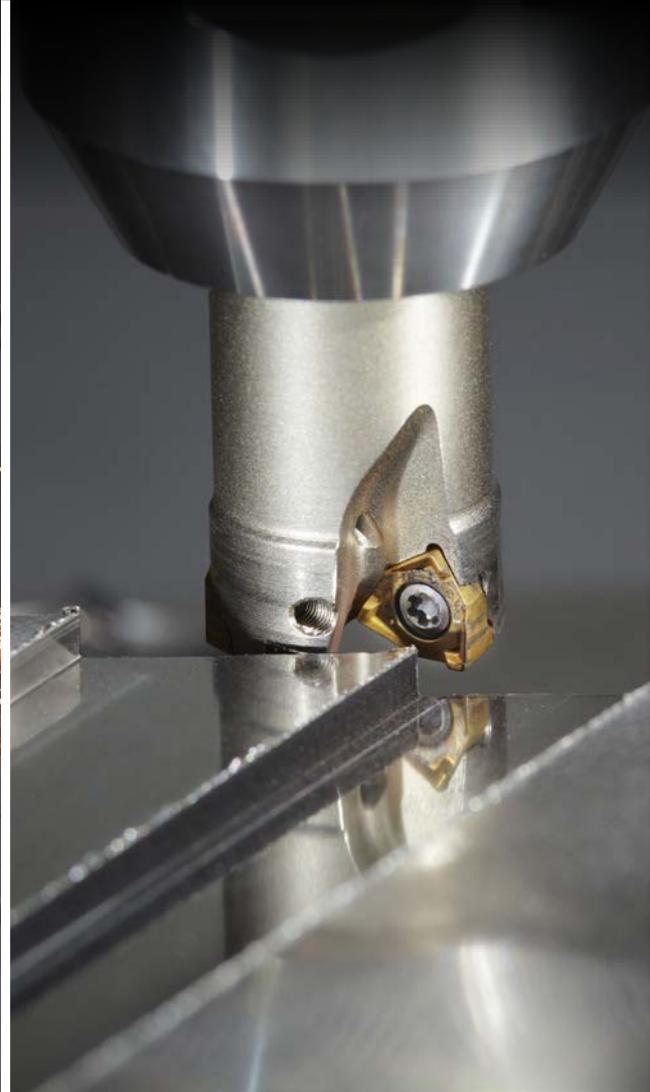
Place Create Free Move Free Rotate Joint Constrain Show Show Sick Hide All Pattern Mirror Copy Bill of Materials Parameters Create Derived Substitutes Plane Axis Point UCS Shrinkwrap Shrinkwrap Substitute

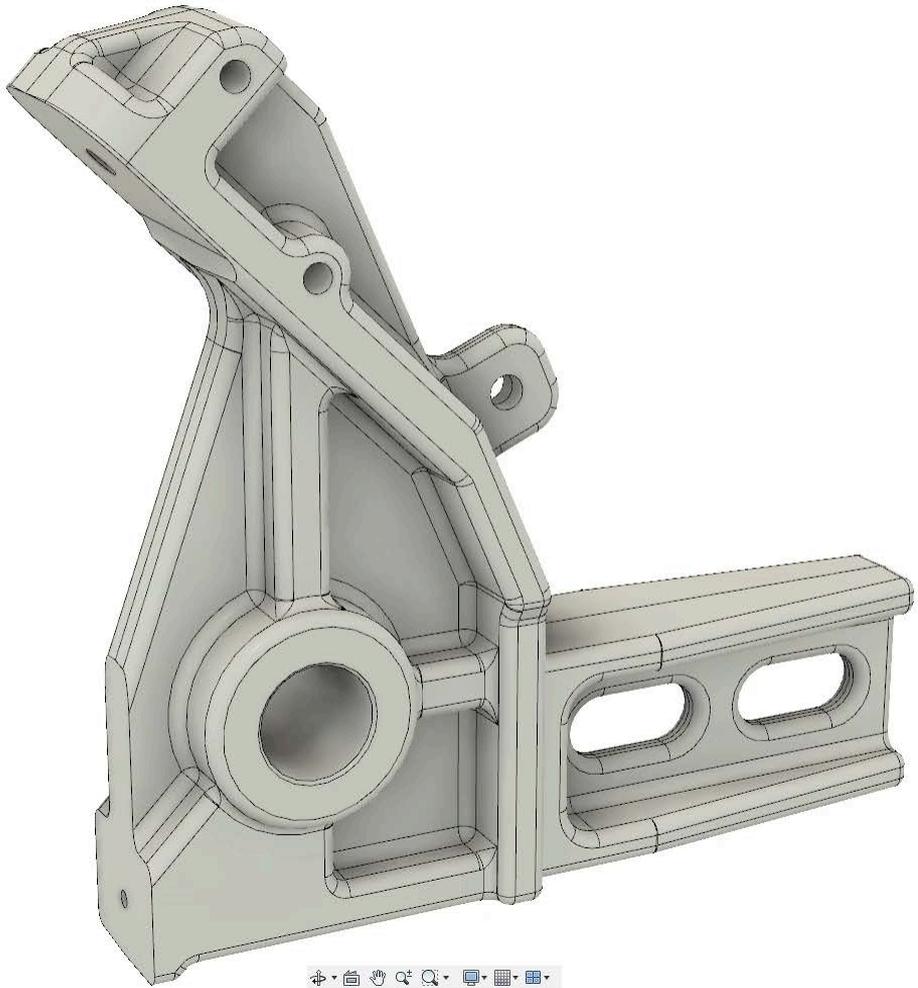
Component Position Relationships Pattern Manage Productivity Work Features Simplification

Model X +

- Assembly | Modeling
- 210-03419_MB_Main_Body_Assy_R5_L
 - Relationships
 - Representations
 - Origin
 - 310-06718_CP_M8_Nylon_Nut_R1
 - 310-06718_CP_M8_Nylon_Nut_R1
 - 210-03716_MB_Rear_Frame_R2_00
 - 210-06710_MB_Center_Connect_Pl
 - 210-06686_MB_Seat_Post_Protect
 - 300-06678_MB_Holder_Rear_Beam
 - 210-06241_EE_Motor_Brake_Assy_
 - 210-06242_EE_Motor_Brake_Assy_
 - 300-06069_MB_Torsion_Spring_Link
 - 300-06069_MB_Torsion_Spring_Link
 - 310-06766_MB_Collar_GFM10102_1
 - 310-06766_MB_Collar_GFM10102_1
 - 300-03186_MB_Iq_R1_00_GDO1:1
 - 310-03189_CP_Spring_F7560_R1_L
 - 310-06119_MB_Key_Lock_R1_00_C
 - 310-06178_CP_Collar_ID11_d8:1
 - 310-06178_CP_Collar_ID11_d8:2
 - 310-06706_CP_Cap_M10_160_R1_
 - 310-00990_CSHBTTF-ST3B-D5-10_J
 - 310-00990_CSHBTTF-ST3B-D5-10_J
 - 310-06790_MB_Tipping_Lever_Rolk
 - 310-06790_MB_Tipping_Lever_Rolk
 - 210-06688_MB_Cover_Fender_Spo
 - 210-07062_MB_Cover_Fender_Spo
 - 210-06493_EE_Motorcontroller_Lab
 - 210-06054_EE_MB_Cable_Assy_R2
 - 350-03936_EE_Connector_Bottom_
 - 310-06413_CP_Tapping_Screw_P_I
 - 310-06413_CP_Tapping_Screw_P_I
 - 210-03459_TR_Rear_Tire_Assy_Ru
 - 210-03459_TR_Rear_Tire_Assy_Ru
 - 310-03999_CP_Flange_Cap_M8-25
 - 310-03999_CP_Flange_Cap_M8-25







POWERFUL PORTFOLIO



600

Software Developers



> \$1 B

Invested by Autodesk



6

Manufacturing
Innovation Centers

The Future of Making Starts Here

The Autodesk Technology Centers bring together industry, academic, and entrepreneurial communities to create a shared vision of the future of making. In these spaces, Autodesk helps bring solutions to life that enable people to do more and make better things with less negative impact on the world.

THE AUTODESK ADVANTAGE

Value – access what you need when you need it

Coverage – we are all the software you need – simple to complex

Innovation – constantly developing new technologies & processes



DRIVING YOUR BUSINESS FORWARD



MORE

Products



BETTER

Performance



LESS

Waste



AUTODESK[®]

Make anything[™]