

Altair: Advanced Manufacturing Trust Showcase October

Raj K. Bishnoi

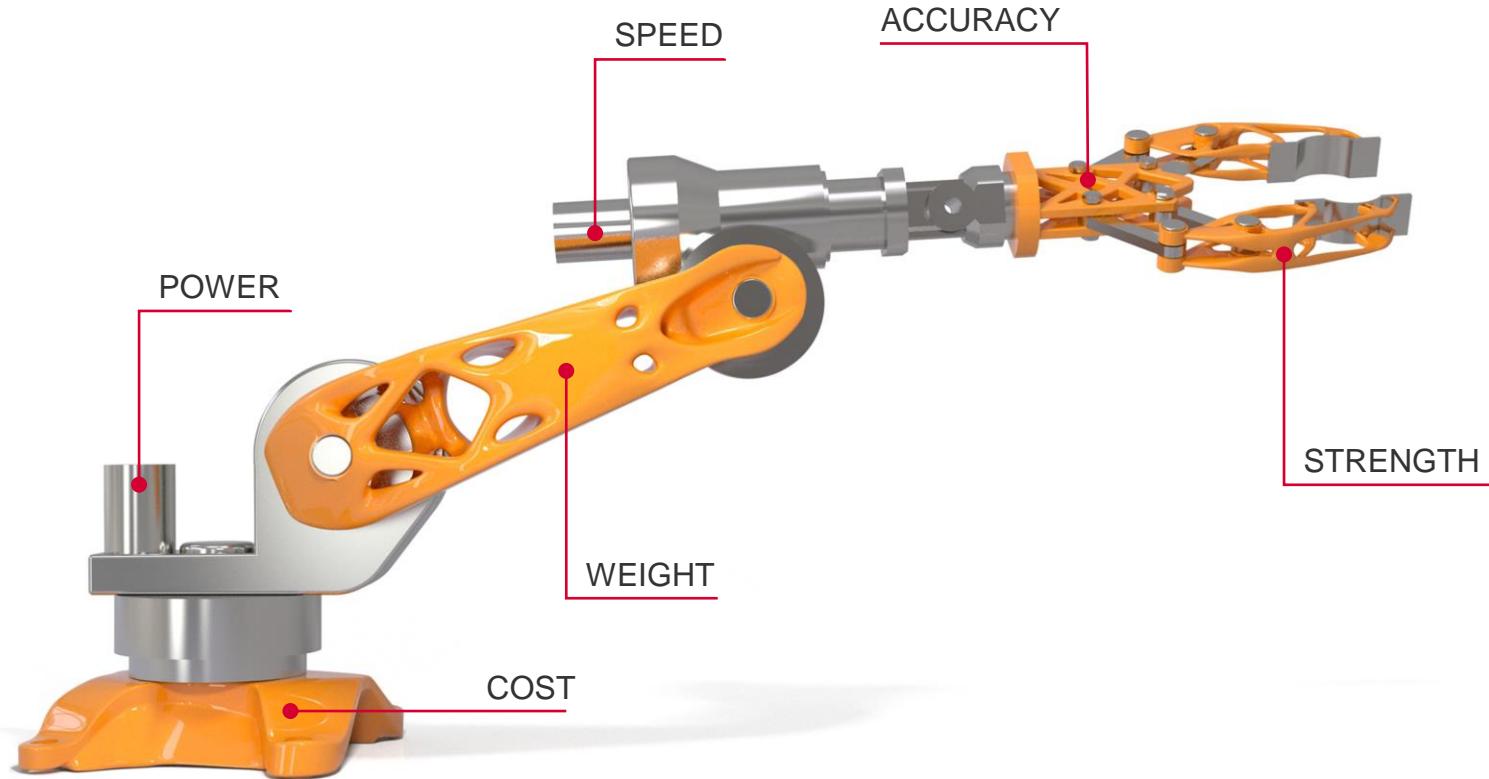
Sr. Technical Account Manager

10/19/2022



Altair

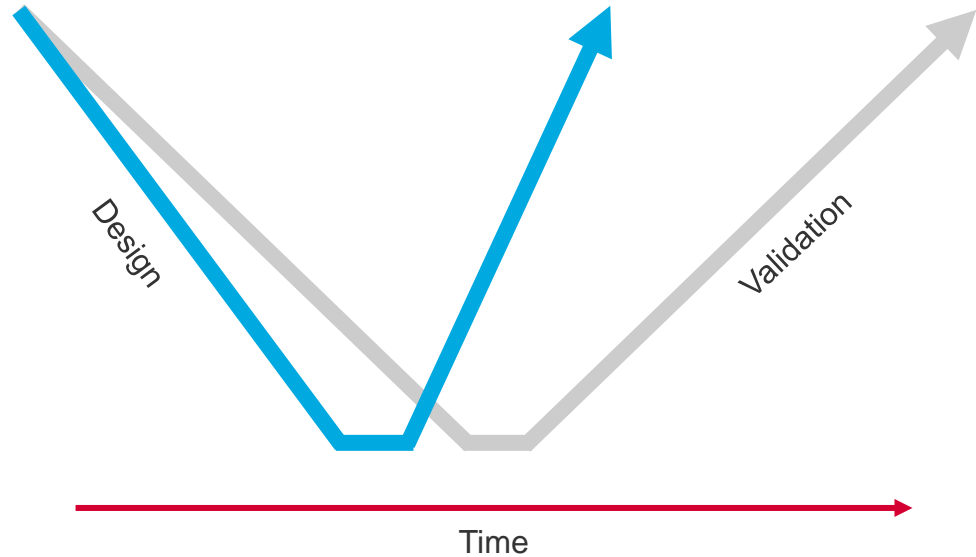
The Challenges of Designing Innovative Products



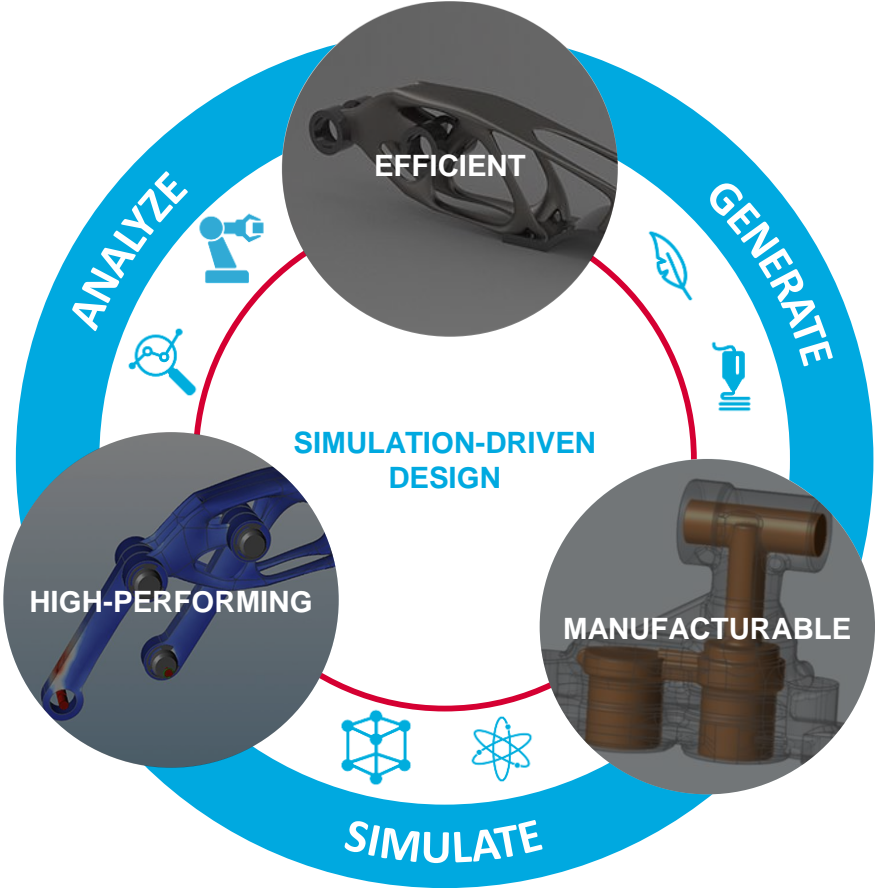
Virtual Product Development “Vee” through Simulation-driven Design



- Traditional Process
- With Inspire



Altair Inspire - Accelerate Simulation-driven Design



Altair Inspire - Accelerate Simulation-driven Design

Altair Inspire accelerates the creation, optimization, and study of innovative, structurally efficient parts and assemblies through collaboration.



Create & Modify Designs with Ease

Generative Design for all processes

Easy loads extraction

Multiple assembly configurations



Simulate at the Speed of Design

Structural Analysis

Dynamics Motion of assemblies

Customizable Materials



Optimize for Manufacturability

Traditional and additive manufacturing

Quick feasibility assessment

Process-driven workflows



Altair Inspire - from Studio to Manufacturing

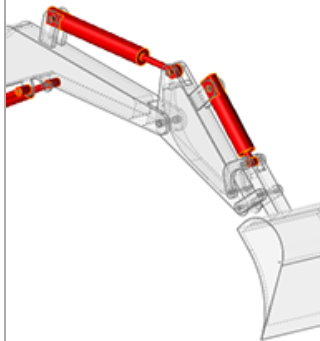
Studio



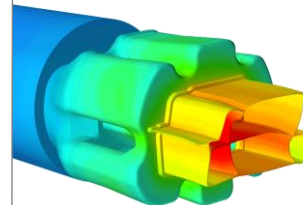
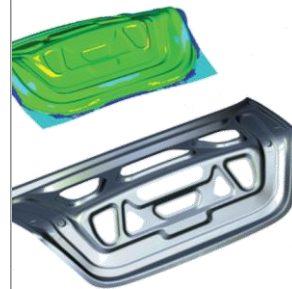
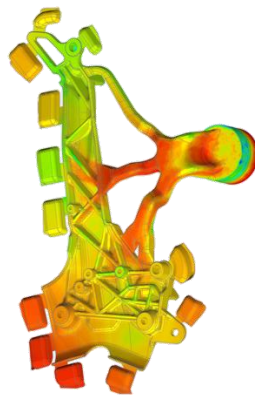
Structures



Motion



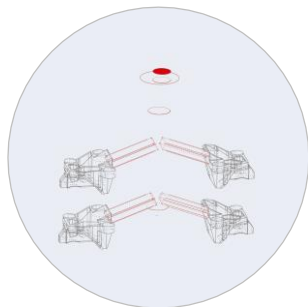
Manufacturing Processes



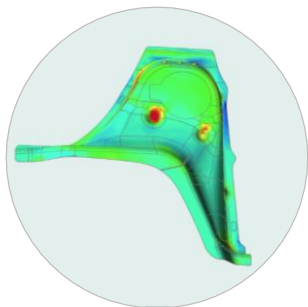
The industry's most powerful and intuitive solution for design engineers to create high performing and manufacturable products.



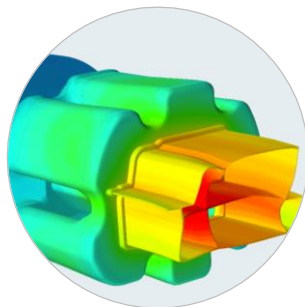
Manufacturing Simulation Within The Design Process



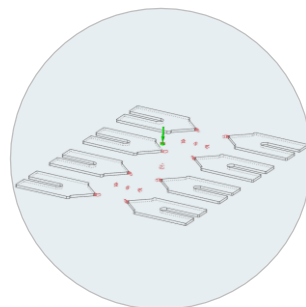
Casting



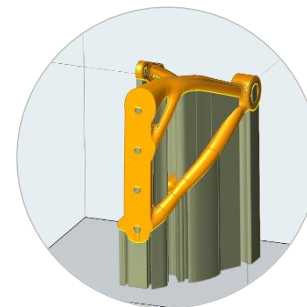
Metal Forming



Extrusion
(Metal and Polymer)



Molding



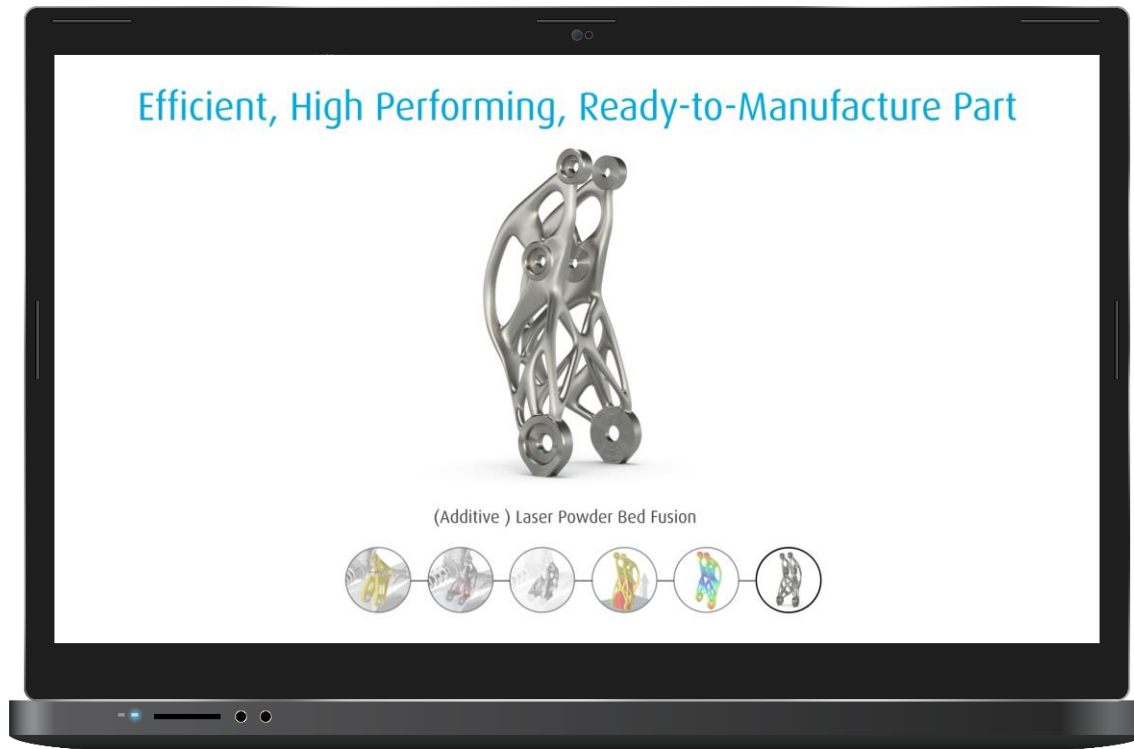
Additive

Deeply integrated within Altair's intuitive simulation solutions for design engineers to create **manufacturable** high-performance products



From Capability to Capacity

Moving additive manufacturing from an advanced capability for prototyping to a production capacity

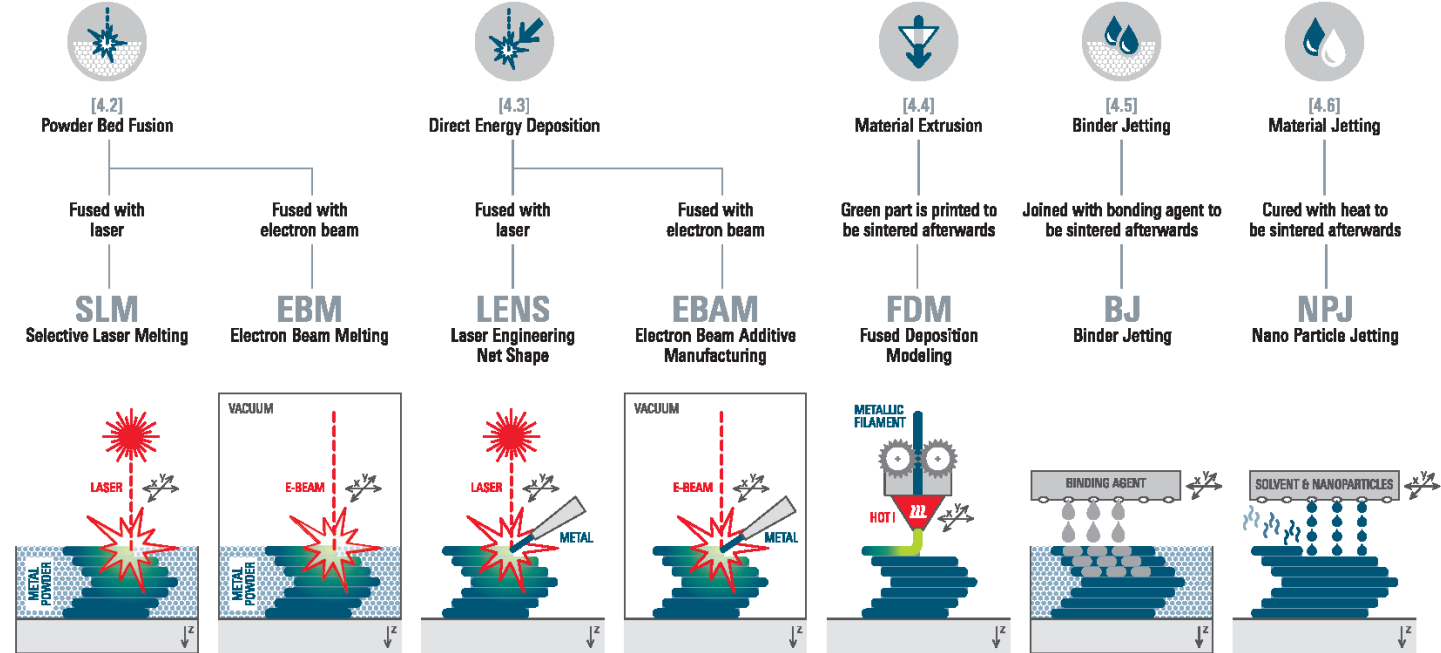


Additive Manufacturing for Metal Parts

formnext

ADDITIVE MANUFACTURING FOR METAL

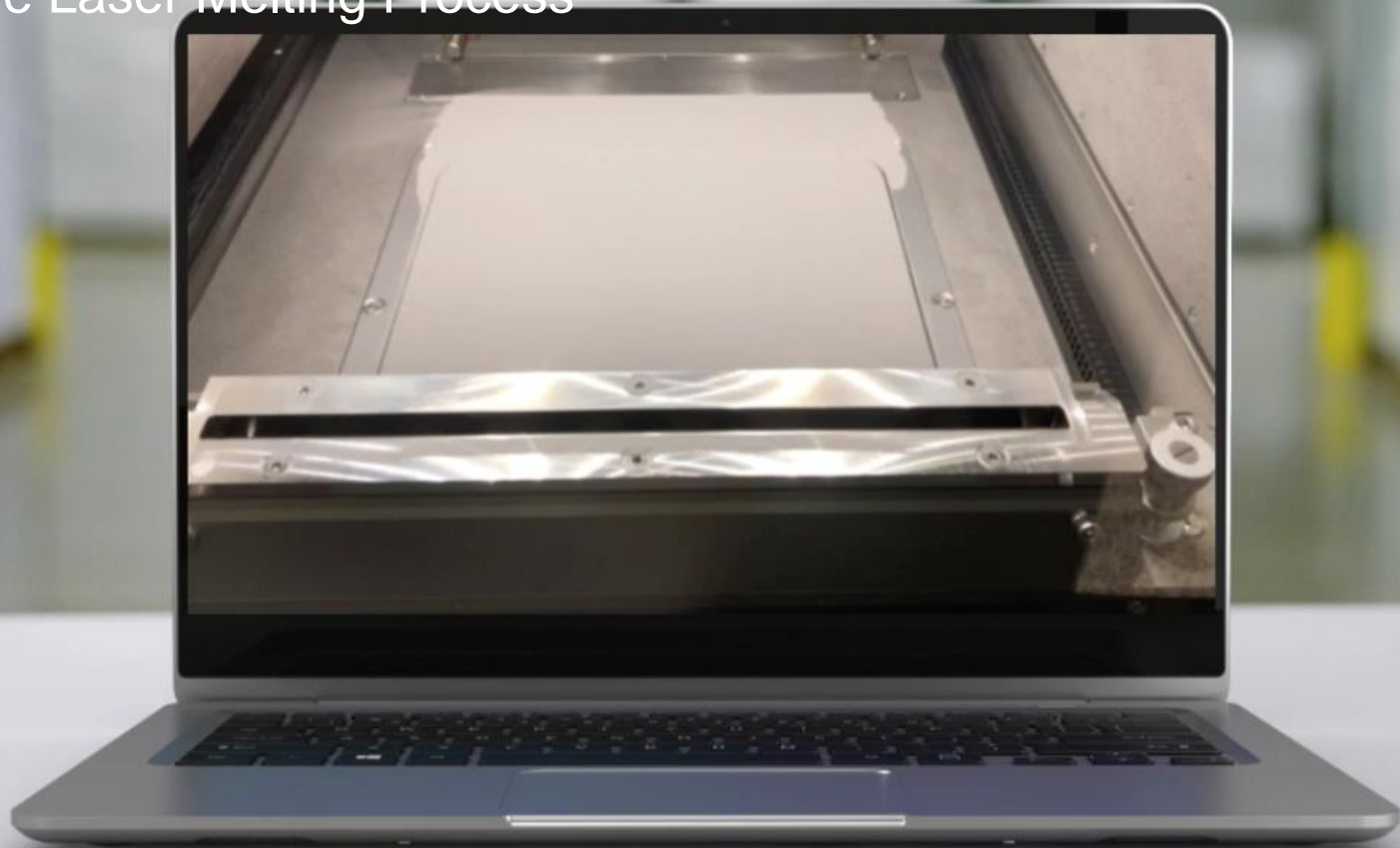
formnext.com



Source: Steffen Ritter, Mesago Messe Frankfurt



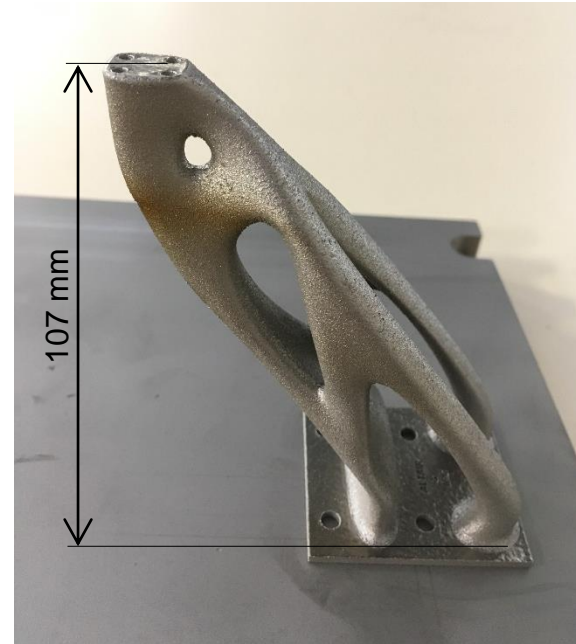
Selective Laser Melting Process



Importance of Part Positioning

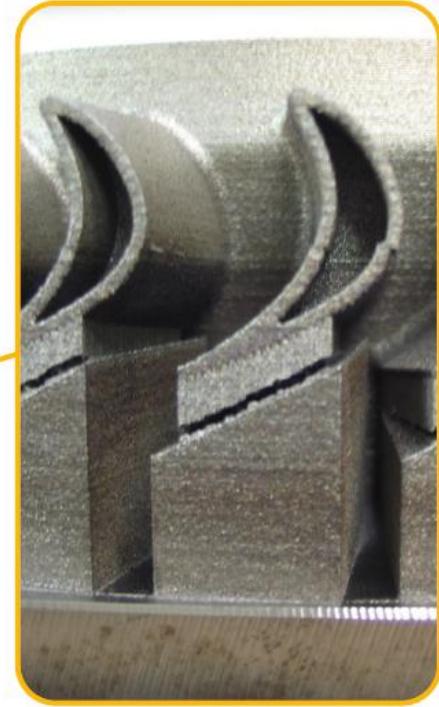
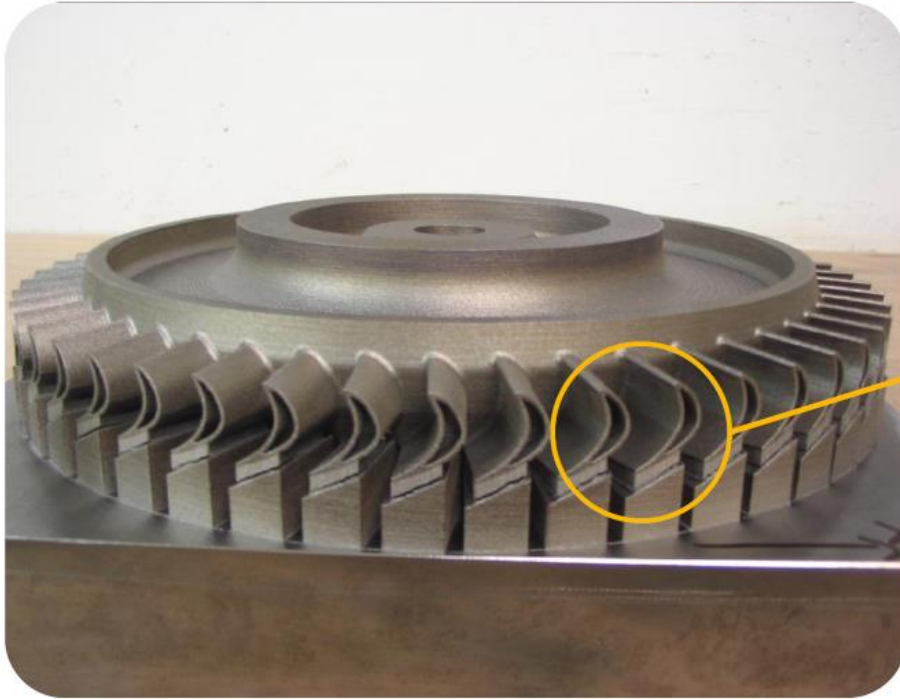


Printing time : 6h (per part)



Printing time : 11h

Typical Manufacturing Failures

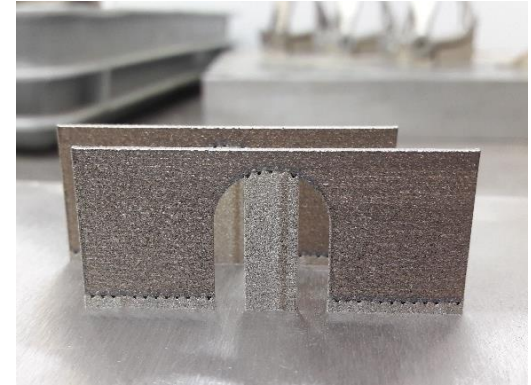
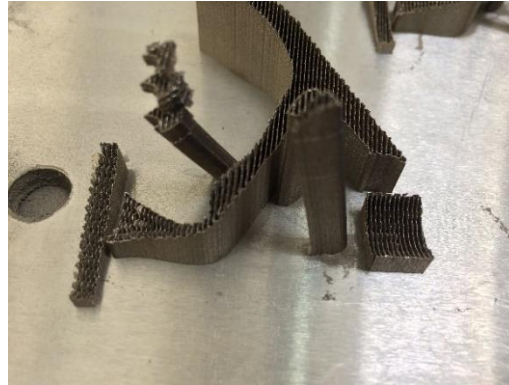


Source:



Support Structure

It's paramount to find a compromise between support removal time (can be hours) and support efficiency (must not degrade part quality)



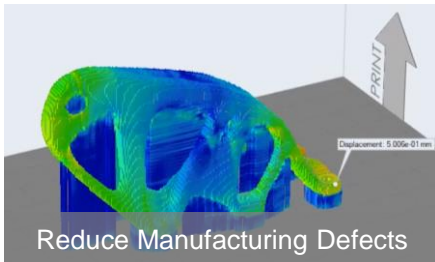
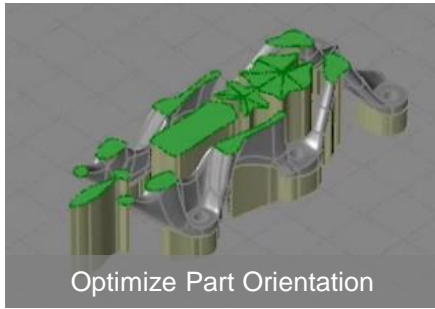
Place Supports Only Where Needed



Original Design

Optimal Design

Inspire Print3D - Efficient Design for Additive Manufacturing (DfAM)



Print it right the first time!



Process-driven Workflow - Select and Prepare Part



Select and prepare part



Configure printer



Orient part(s)



Generate print supports



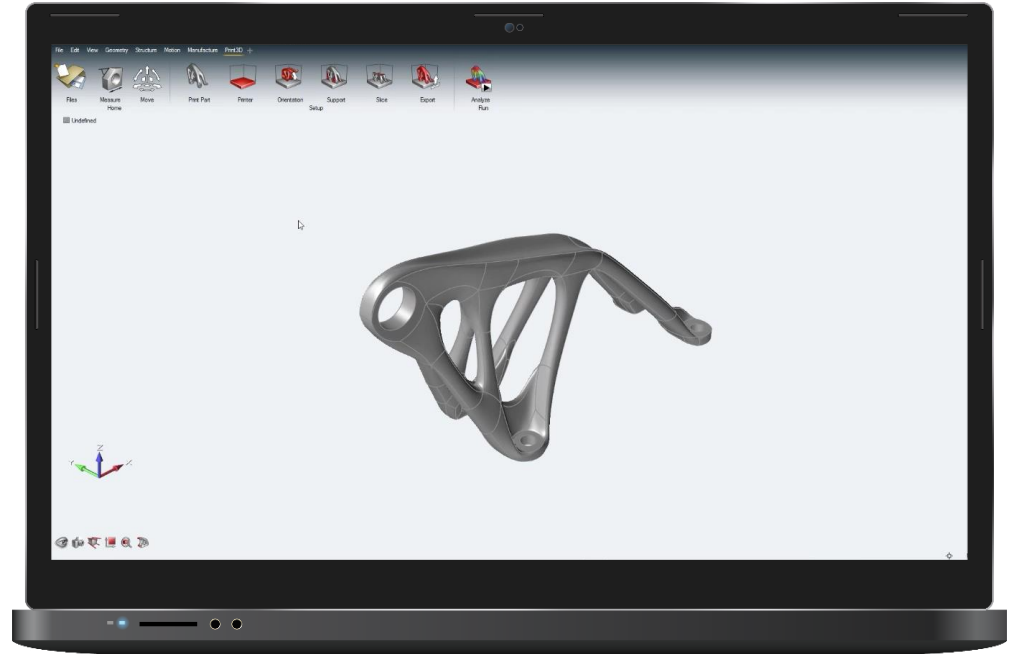
Preview slices



Export part and supports



Run thermo-mechanical analysis



Process-driven Workflow – Configure Printer



Select and prepare part



Configure printer



Orient part(s)



Generate print supports



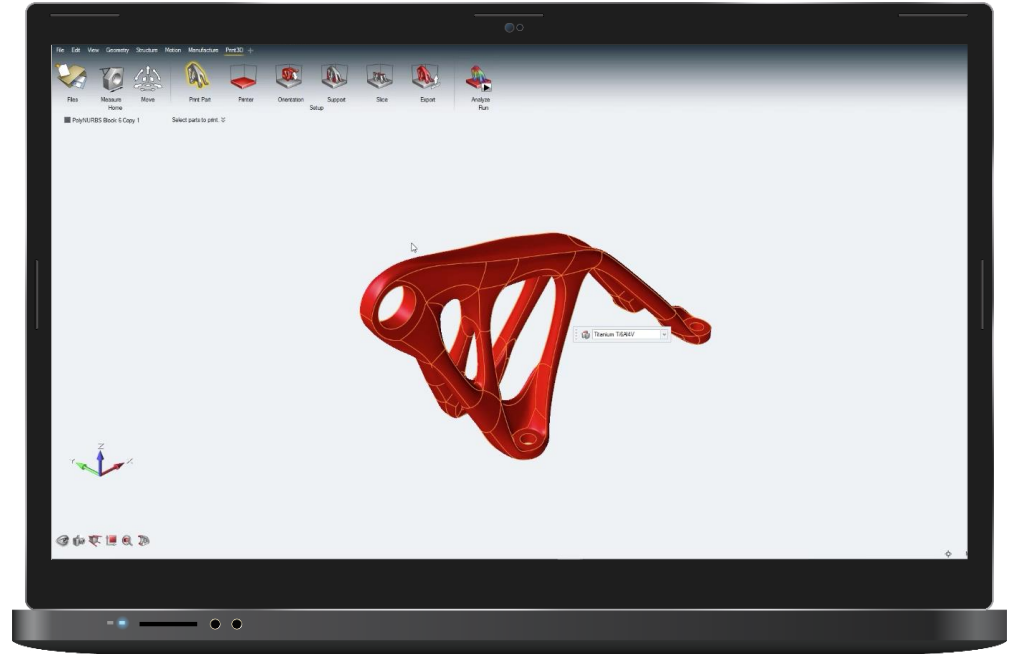
Preview slices



Export part and supports



Run thermo-mechanical analysis



Process-driven Workflow – Orient Part(s)



Select and prepare part



Configure printer



Orient part(s)



Generate print supports



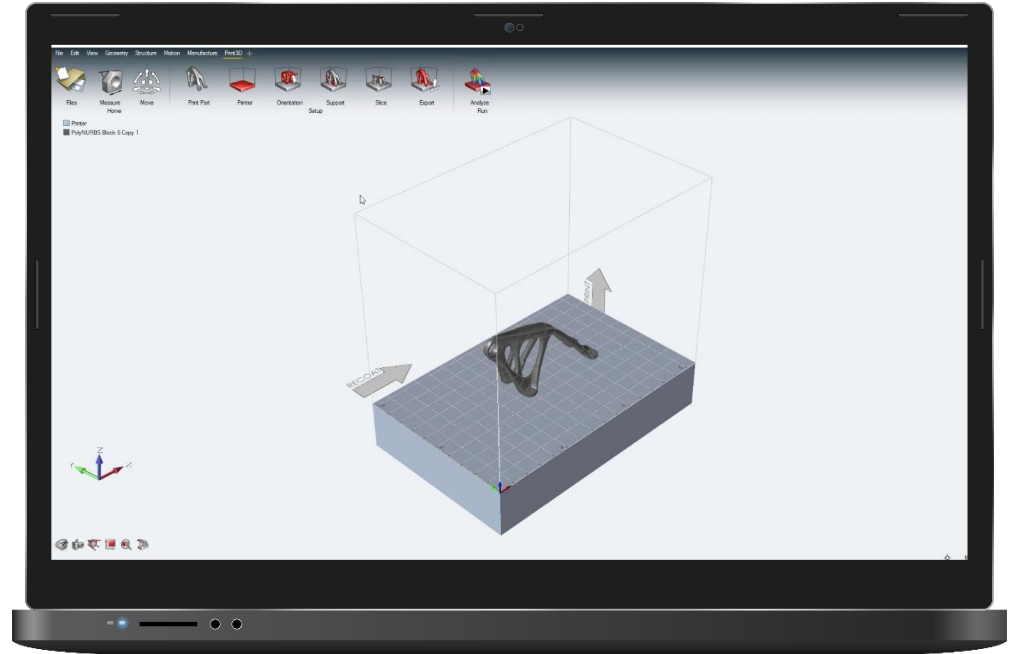
Preview slices



Export part and supports



Run thermo-mechanical analysis



Process-driven Workflow – Generate Print Supports



Select and prepare part



Configure printer



Orient part(s)



Generate print supports



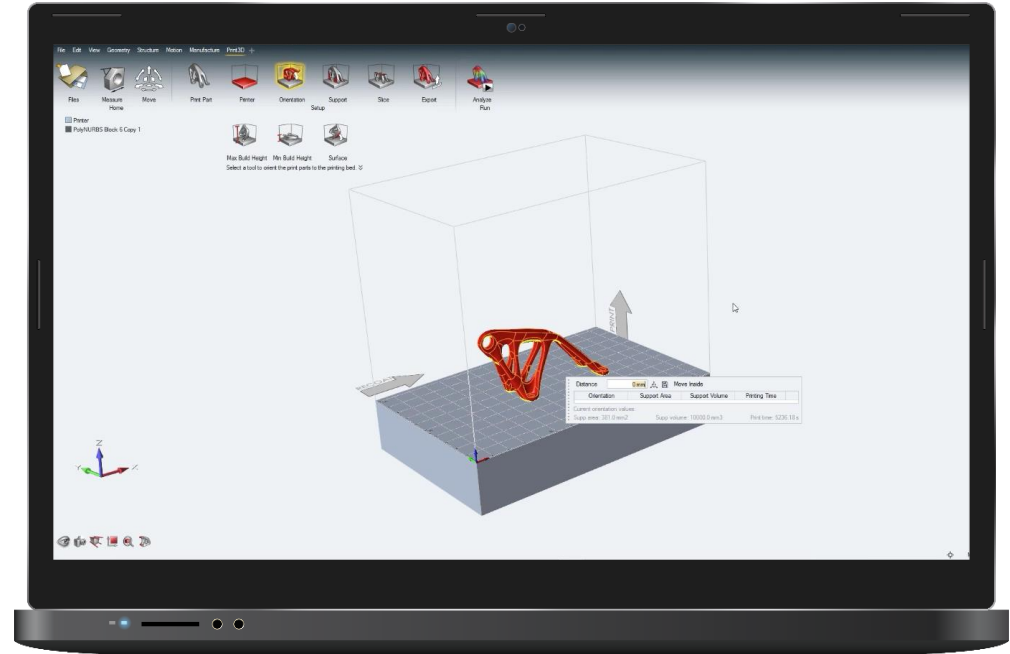
Preview slices



Export part and supports



Run thermo-mechanical analysis



Process-driven Workflow – Preview Slices



Select and prepare part



Configure printer



Orient part(s)



Generate print supports



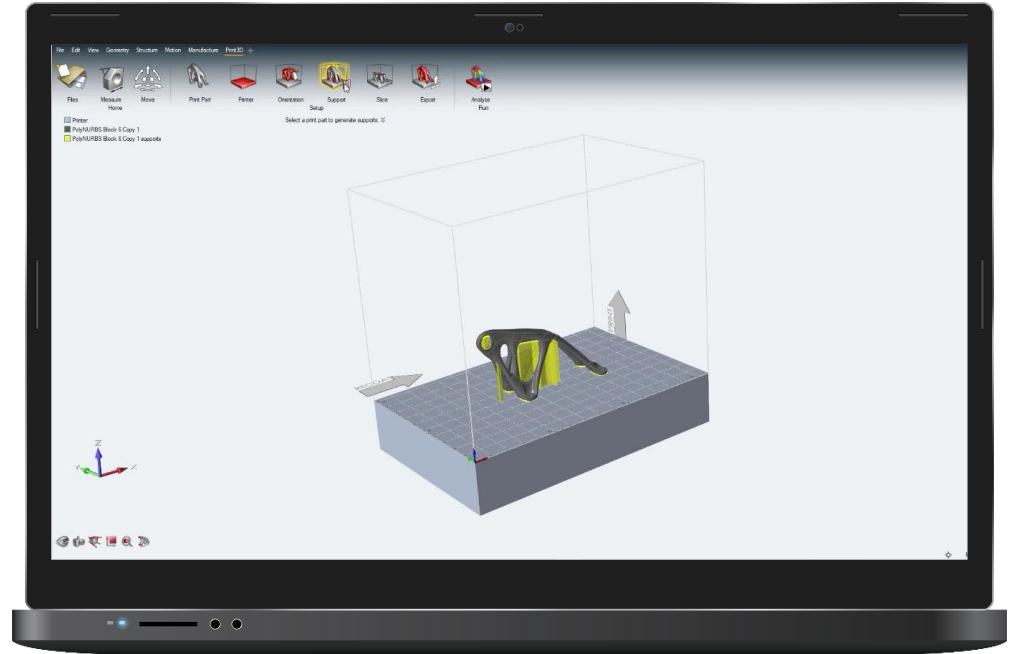
Preview slices



Export part and supports



Run thermo-mechanical analysis



Process-driven Workflow – Export Part and Supports



Select and prepare part



Configure printer



Orient part(s)



Generate print supports



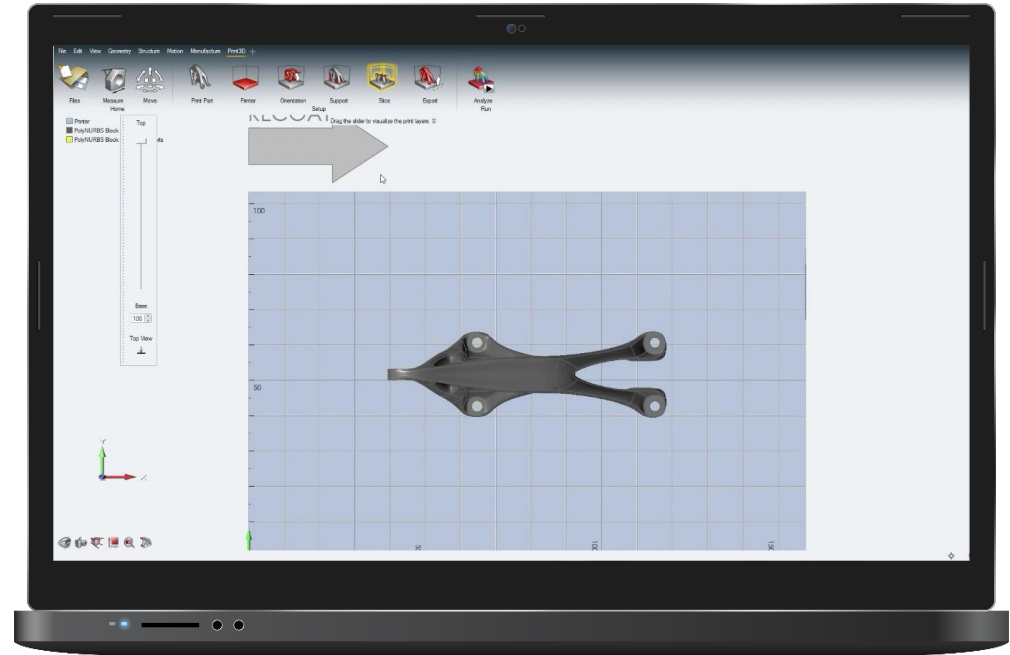
Preview slices



Export part and supports



Run thermo-mechanical analysis



Process-driven Workflow – Run Thermo-mechanical Analysis



Select and prepare part



Configure printer



Orient part(s)



Generate print supports



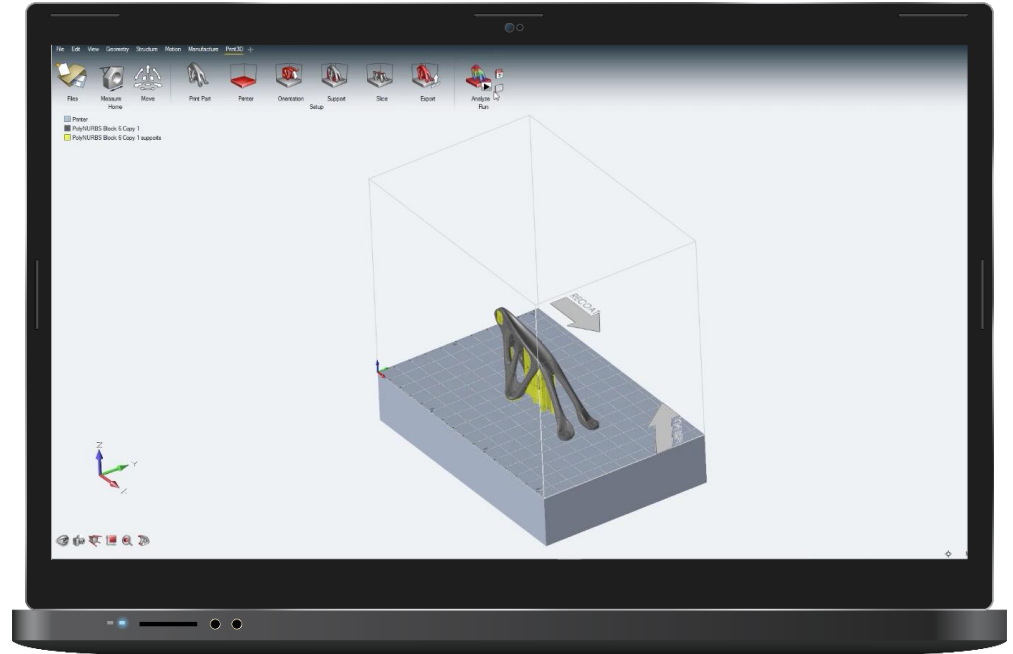
Preview slices



Export part and supports



Run thermo-mechanical analysis



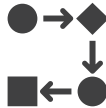
Key Features

Part and Support Design



Generate support structures as part of the design process, where you design the part

Easy-to-learn Environment



The intuitive, process-driven user experience enables users to gain deep manufacturing insights quickly

Thermo-mech. Printing Analysis



Run the embedded thermo-mechanical solver to accurately simulate the entire printing process

Defects Identification



Easily detect defects - large deformation, excessive heating, delamination - to aid design modifications

Materials and Printers



Select from the growing library of additive manufacturing materials and standard printers included

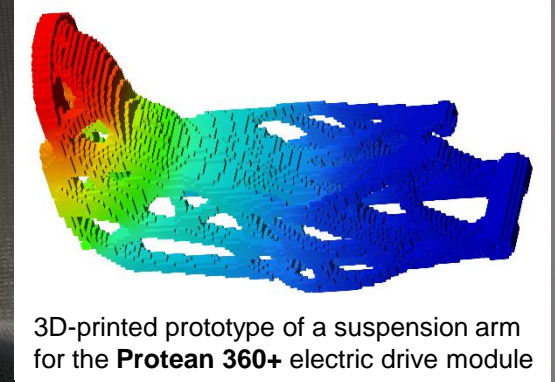
Ready for Printing



Assess the part to validate its geometry, then export a printing file containing part and supports



M&H CNC-TECHNIK GmbH



3D-printed prototype of a suspension arm for the **Protean 360+** electric drive module

“The introduction of Inspire Print3D adds new possibilities and greatly enhances the capabilities for us to evaluate our designs and customer parts prior to manufacturing in order to react accordingly to any arising problems upfront. Being able to make unique parts correctly the first time is a competitive advantage [for us].”



The Inspire Print3D Competitive Advantage

Reduce Manufacturing Cost



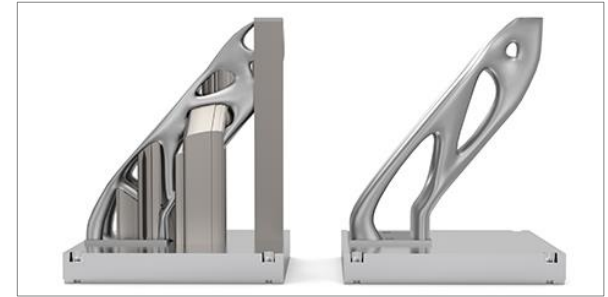
Minimize part supports and correct defects such as part deformation and overheating before printing

Increase Process Efficiency



A single, easy, fast, and accurate environment from generative design to manufacturability assessment

Design Optimal Parts



Create best performing designs for the SLM process by applying advanced thermo-mechanical simulation



Learn more at
altair.com/inspire

