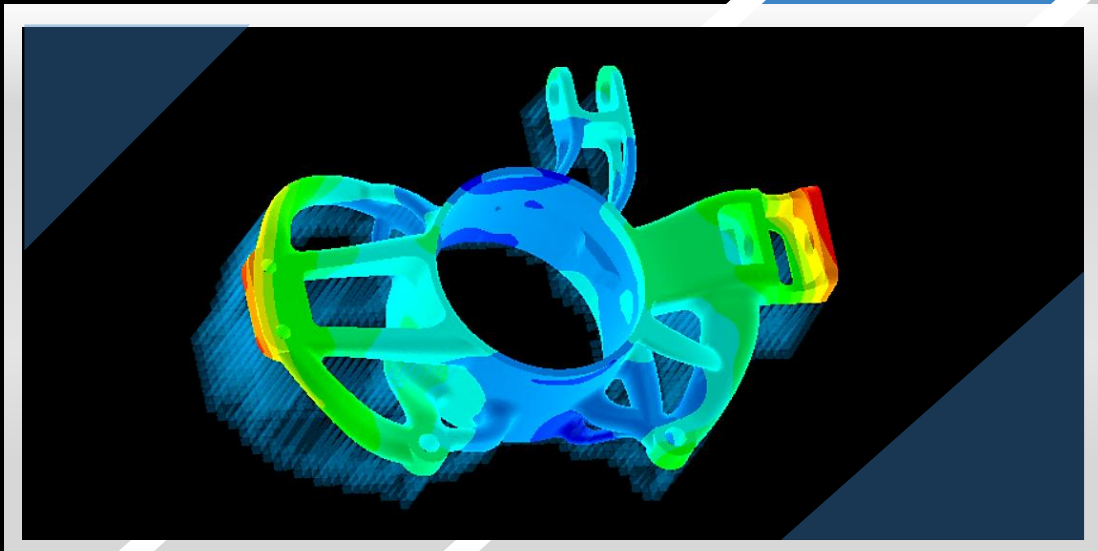
AdditiveLab



AdditiveLab

Metal Additive Manufacturing Simulation.

Product Brochure

www.additive-lab.com

Simulation for Metal AM.

Metal Additive Manufacturing (AM) enables the production of highly complex and optimized designs. The AdditiveLab software solutions help ensure successful production of complex AM parts by providing simulation technology that can predict manufacturing outcomes and provide better insight into process behavior.

With the AdditiveLab software, failure-prone regions can be identified and corrected, and machine parameters can be optimized to increase manufacturing success and, subsequently, save time and money.

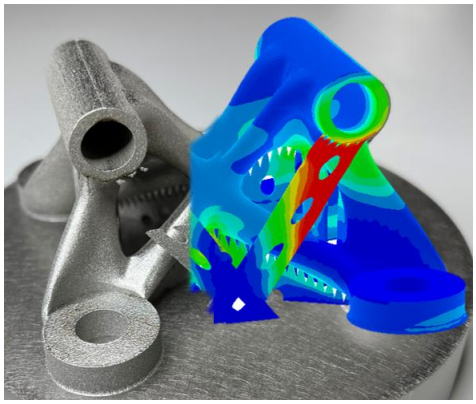
AdditiveLab RESEARCH.

Metal Powder Bed Fusion process simulation.

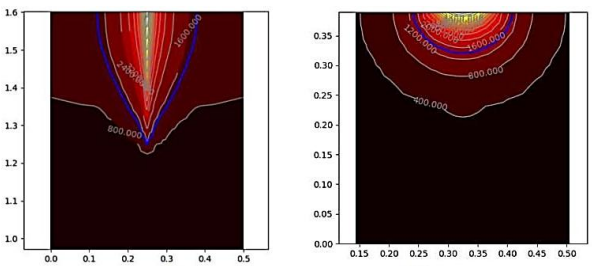
Clear insight.

AdditiveLab RESEARCH provides mechanical simulations via a simple user-interface and highly automated model preparation processes, reducing state-of-the-art AM process simulation workflows to just a few clicks.

The visual feedback of simulation results in AdditiveLab allows users to quickly identify *critical regions*: regions that experience large deformations, localized stress concentrations, recoater collisions, cracks, or excessive temperatures.



Deformations predicted as red zones in AdditiveLab via mechanical analysis.



The temperature graphs are simulating the melt pool shape based on the given production process parameters forming the Keyhole (left) and the Conductive (right) mode of powder melting.

Powerful.

AdditiveLab RESEARCH enables simulation engineers to perform AM process simulations from micro-scale up to full build configurations. It supports a variety of simulation modules including thermal and thermo-mechanically coupled analyses at part and scan-path level with fast execution times thanks to multi-core CPU support.

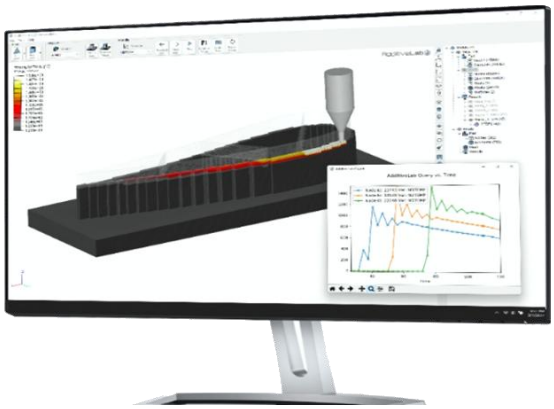
The fully integrated Python API gives users complete access to all the extensively documented simulation features and functions. It empowers users to automate workflows and develop custom innovations.

AdditiveLab RESEARCH - DED.

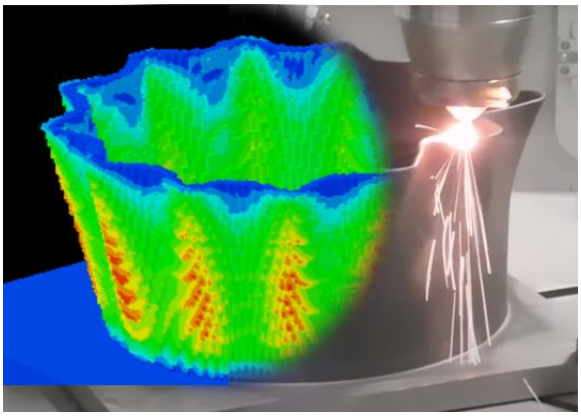
Metal Direct Energy Deposition, WAAM process simulation.

Simulation for DED.

AdditiveLab RESEARCH - DED enables simulation engineers to perform AM process simulations on technologies that use Direct Energy Deposition (DED) with wire or powder feed. Often referred to as DMD, DED, WAAM and LMD. The AdditiveLab RESEARCH - DED software helps to reduce trial-and-error testing by providing simulation technology that can predict potential manufacturing outcomes of DED processes.



DED and WAAM deposition-path based process simulation by AdditiveLab.



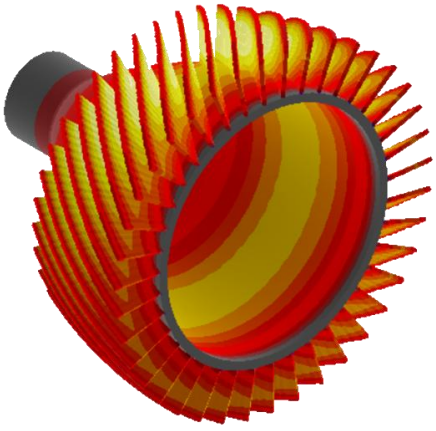
AdditiveLab RESEARCH - DED process simulation predicting displacement zones of the part to be produced. The part production via DED process (BeAM system). (Ref BeAM machines, www.beam-machines.com).

Predict and Prevent.

AdditiveLab RESEARCH - DED empowers users to understand, predict and optimize manufacturing outcomes. The simulation results in AdditiveLab allow identification of *critical regions*: regions that suffer from large deformations, and localized stress concentrations.

Heat Management.

AdditiveLab RESEARCH - DED enables detailed thermal simulations of the AM build process. The results enable analysis of time-dependent temperature fields, which help mitigate the risk of lack of fusion and overheating during production.



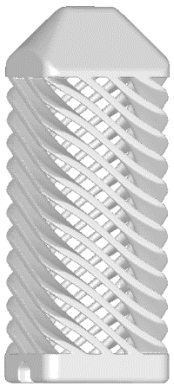
AdditiveLab RESEARCH - DED process simulation predicting temperature profiles of the part to be produced.

Case Study:

Prediction of Excessive Deformations and Simulation-Guided Production.

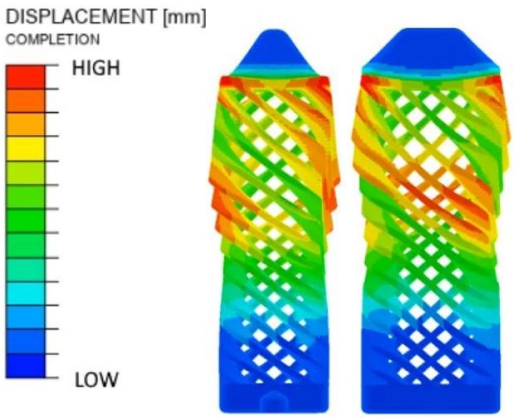
Challenge 1:

Simulate the AM process of an innovative spinal fusion cage design and predict critical deformations observed in production.



Original Spinal Cage design.

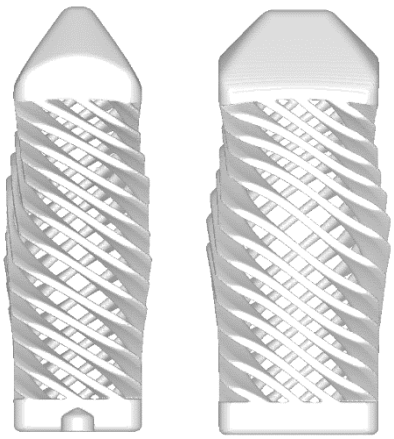
Production result of Spinal Cage showing the Displacement distribution; Left: lateral view, Right: frontal view (Courtesy of Tangible Solutions).



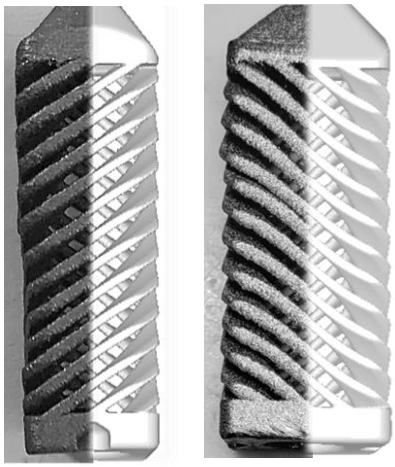
Simulation of Spinal Cage showing the Displacement distribution via AdditiveLab mechanical analysis; Left: lateral view, Right: frontal view.

Challenge 2:

Generate a counter-deformed design based on predicted deformations to ensure successful production.



Simulation driven fully automated Counter-Deformed design of Spinal Cage via AdditiveLab; Left: lateral view, Right: frontal view.



Production result of Counter-Deformed Spinal Cage showing the Displacement distribution; Left: lateral view, Right: frontal view mapped against original part design (Courtesy of Tangible Solutions).

For more information or demo requests, contact info@additive-lab.com.

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