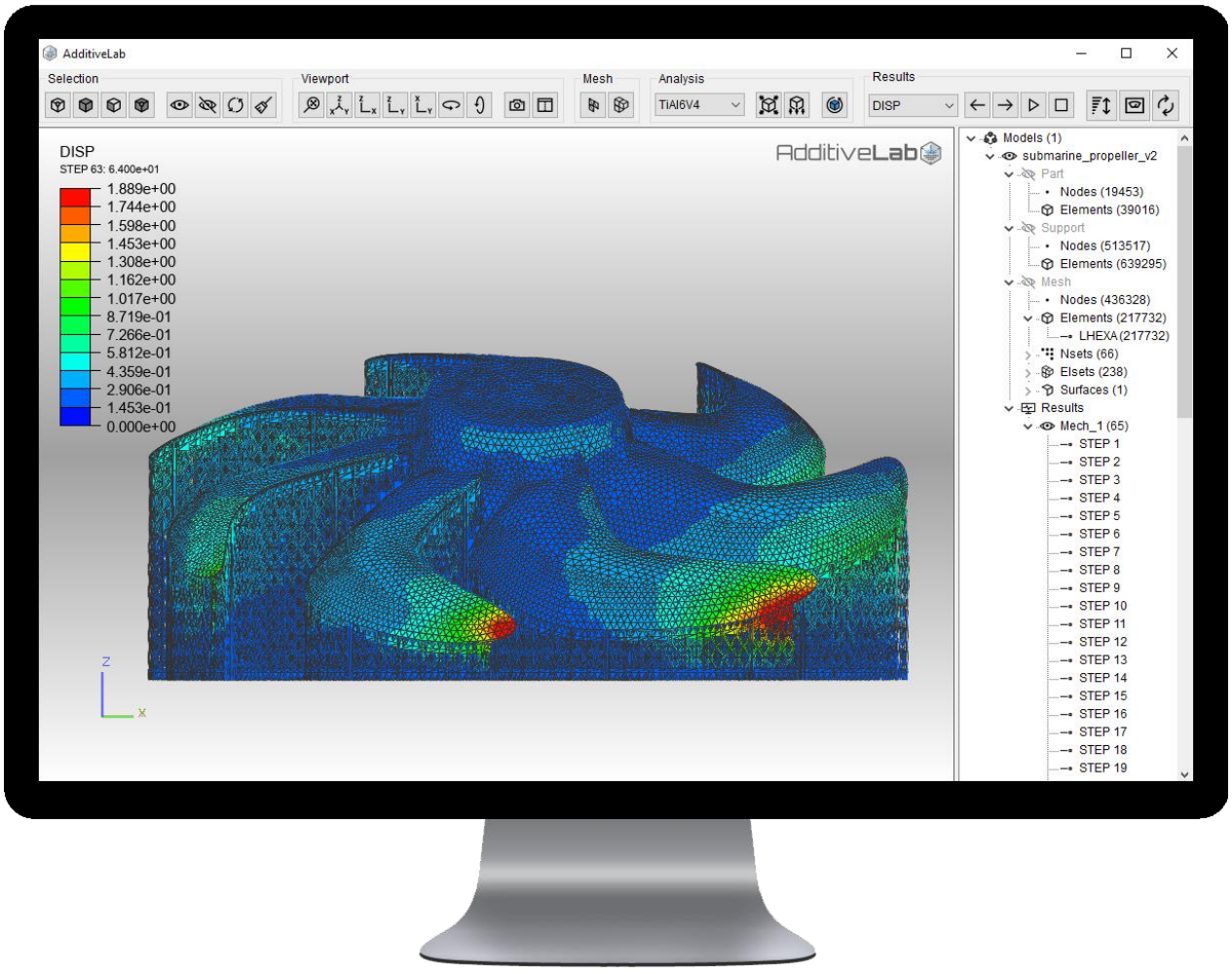
AdditiveLab

Metal Additive Manufacturing Simulation.

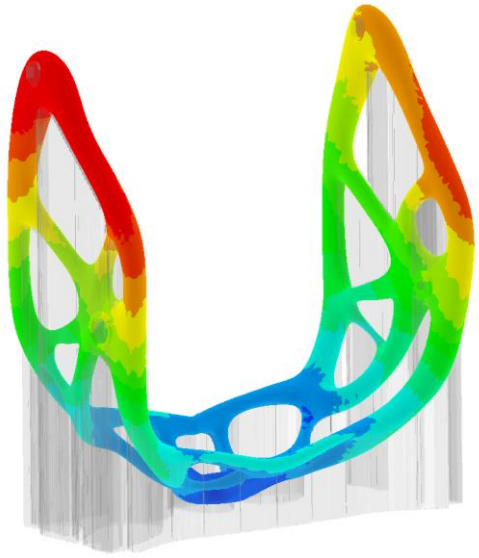


www.additive-lab.com

Why is Simulation critical for Metal AM?

Purpose.

Utilization of Metal Additive Manufacturing (AM) to replace traditional production of parts at an industrial level is a fairly new challenge for many companies. Particularly in the early phase of adapting AM technology, companies commonly spend several weeks with trial and error tests to find build configurations that succeed. This is inefficient and a waste of time and money. The software AdditiveLab helps to cut back the trial and error tests by providing simulation technology that can predict outcomes of AM processes. With AdditiveLab failure-prone regions can be identified and manufacturing configurations optimized to increase the manufacturing success, and subsequently, save time and money.

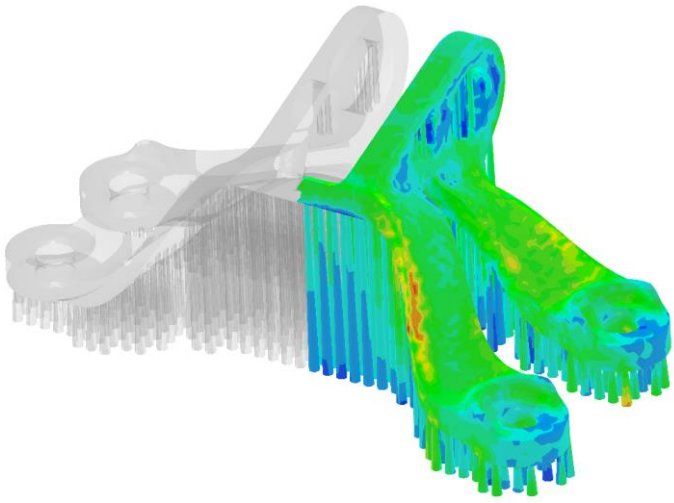


Simple usage.

AdditiveLab was particularly developed to address the engineering needs of AM engineers without requiring simulation knowledge. It provides a very simple user-interface and highly automated model preparation processes, reducing the state-of-the-art AM process simulation to only a few clicks.

More insight.

AdditiveLab allows users to investigate, understand and learn more about their manufacturing processes. The visual feedback of simulation results in AdditiveLab allows to quickly identify critical regions - regions that suffer from large deformations, localized stress concentrations and excessive temperatures.



High Value.

With utilizing AdditiveLab in the AM production process chain, time-consuming testing can be replaced with virtual production scenarios. Within only a couple of moments, tendencies of several different build configurations can be simulated and optimal manufacturing configurations can be identified. Not only will this allow to shorten process development and go-to-market times, but also increase the quality of manufactured parts, and enable to cut back cost that would be otherwise spent on testing.

Why use AdditiveLab?

Prepare properly.
Stop production failures and increase your AM process expertise by virtually predicting failure-prone regions in parts and supports prior to manufacturing. Optimize build configurations and enhance the quality of your printing process and manufactured parts prior to production.

Fast.
By applying automated and smart simulation model simplifications, the complex and state-of-the-art simulation physics are reduced to computationally less expensive models allowing for very short simulation times and quick feedback about potential manufacturing outcomes.

Tailored.
AdditiveLab was particularly developed and designed to address the engineering needs of AM process engineers - nothing else. It provides a clean and process oriented workflow and easily interpretable results which are commonly utilized in AM.

Easy.
The AdditiveLab user interface is intuitive and very easy to use. All the complicated model preparation steps that usually come with simulation software have been automated to enable model generation with only a few clicks.

Efficient.
AdditiveLab provides functionality to perform repetitive simulations with the LiveUpdate feature. Once the user has run a simulation, it can be repeated with a single click in case the build configuration has changed.

Expertise.
Our team combines years of experience in AM with extensive simulation knowledge. For years we have been doing nothing else than finding AM simulation methodologies that are fast, accurate and easy to utilize. With AdditiveLab we want to introduce a tailored AM simulation technology that can be easily integrated into the AM process chain and can be used by anyone without requiring simulation knowledge. We believe in AM as one of the most promising technologies in this century and will strive to provide with AdditiveLab a tool to make this technology more efficient.

Case Study:

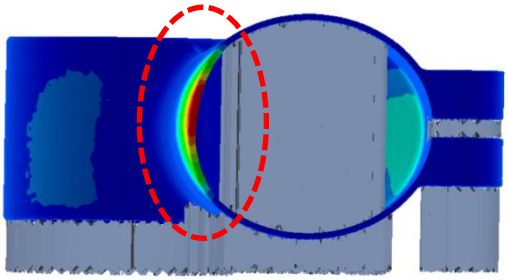
Prediction of excessive deformations and critical stress concentrations.

Challenge:
Simulate the AM process of a seatmast topper and determine critical deformations and part-support interface regions that are critical to failure.

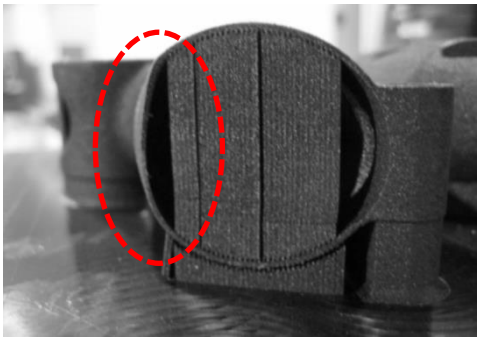
Solution:
Create a mechanical, macro-layer based simulation, visualize and assess deformations and the stress results.

Results:

Excessive deformations
The thermo-mechanical metal AM process leads to residual stresses causing excessive deformations in unsupported regions



Simulated with AdditiveLab



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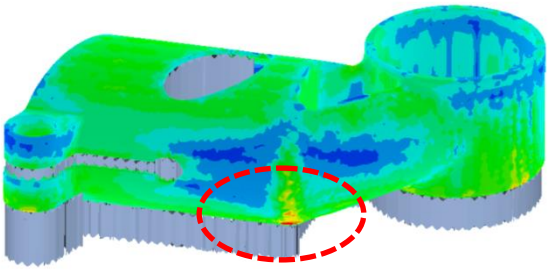
Critical stress concentrations
Critical mechanical stresses occur due to global and local deformations causing the part-support interface to rupture.



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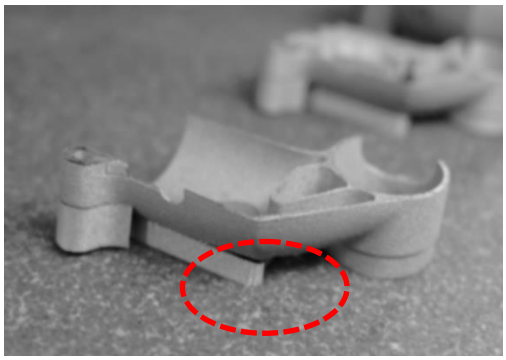

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