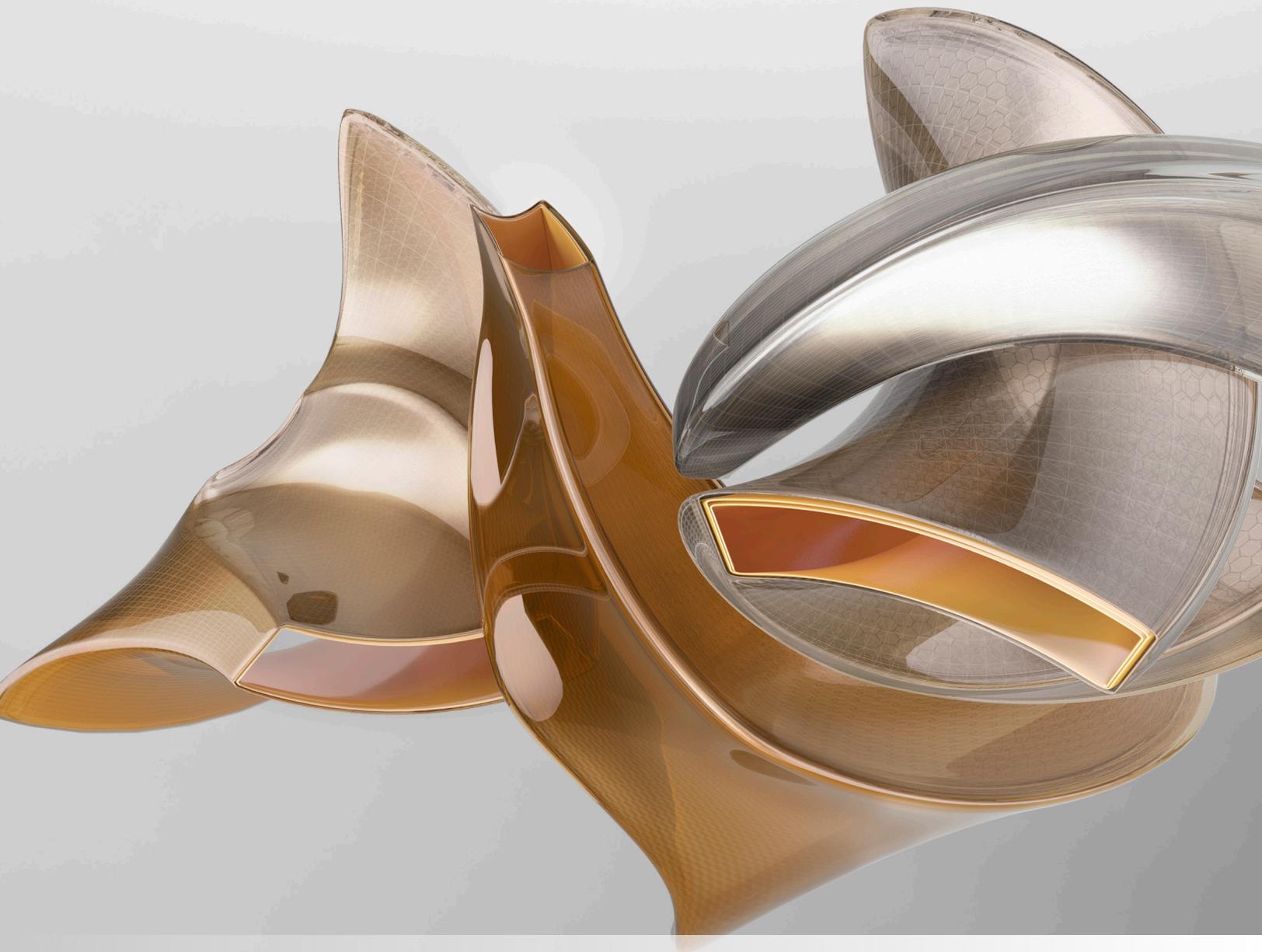


Powerful tools for composite nonlinear analysis



Improve accuracy, efficiency, and convergence for the simulation of composite materials

Composite simulation tools within your FEA code help you make better design decisions earlier in the development process. Using advanced capabilities such as progressive failure to provide insight into failure loads and modes to help you reduce redesigns.

Features and benefits

- Seamless integration into Abaqus/CAE, ANSYS, and MSC SOL 400 platforms for easy adoption
- Transfer as-manufactured information from Autodesk® Moldflow® to an Abaqus structural model
- Support for a wide variety of 2D and 3D elements
- Easy-to-interpret results
- Smooth integration of widely used material data
- Robust convergence through IDS method
- Quick and easy conversion of legacy models

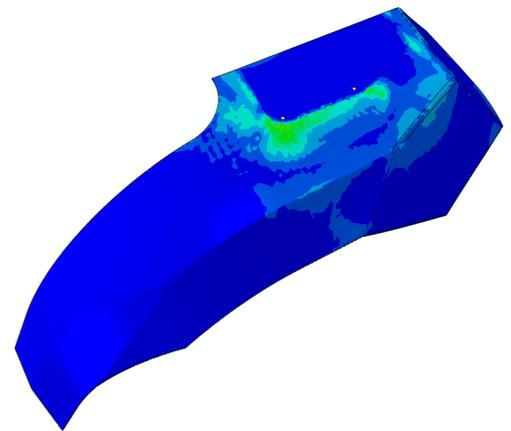
Autodesk® Heliuss PFA software is an add-on for commercial finite element analysis (FEA) programs that is designed to improve accuracy, efficiency, and convergence in composite material simulations. Simulating failure of composite structures earlier in the design process makes it possible to validate designs before experimental testing, which helps to reduce testing time, cost and helps you make great products.

Developed specifically for composite materials, Heliuss PFA replaces traditional generalized analysis with advanced technologies for structural analysis and simulation. It delivers many powerful capabilities, including an efficient multiscale approach for the analysis of material nonlinearity, progressive failure and composite delamination as well as methods to reduce mesh sensitivity.

Heliuss PFA addresses a range of composite analysis types, such as fatigue, nonlinear static, and explicit simulation scenarios. It supports multiple material types including chopped and continuous; unidirectional, plain, 4, 5, and 8 harness weaves. These and other diverse capabilities combine to help you address the unique challenges in the structural simulation of composite materials.

Improved accuracy

Traditional methods treat composite lamina as homogeneous materials with uniform properties throughout. In contrast, Heliuss PFA is based on the multicontinuum theory which computes stresses and strains for all composite constituents. The result: better damage initiation and more accurate prediction of damage propagation at the fiber and matrix level.



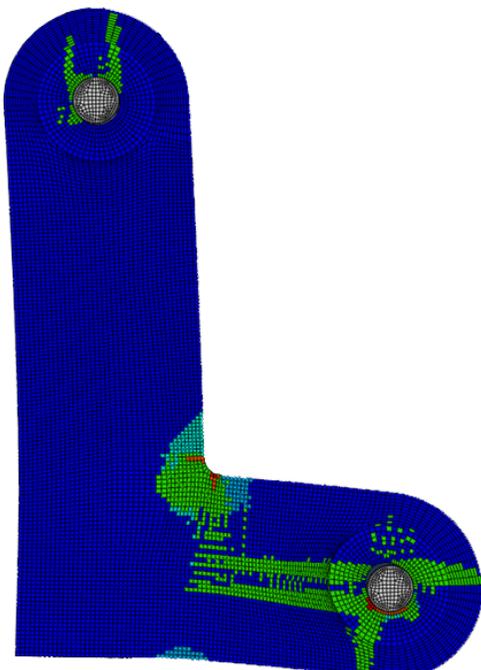
Structural simulation of an injection molded fender.

Built for efficiency

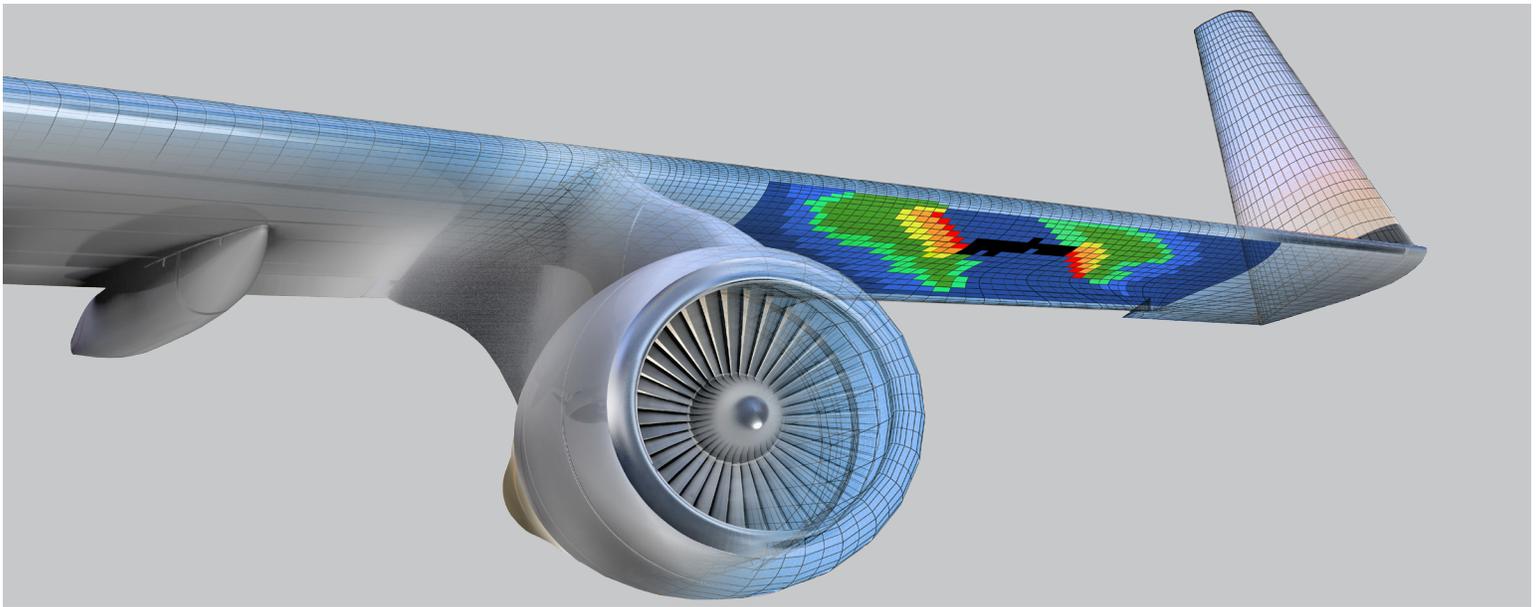
Heliuss PFA includes built-in convergence enhancements formulated specifically for composite materials. These enhancements work with the FEA solver to strengthen the solution process and significantly reduce simulation run-time without the use of viscosity.

Easy adoption

Integrate Heliuss PFA seamlessly with leading FEA packages, even those already in use within your organization, helping you to produce better results. There's no need for expensive, difficult-to-obtain material characterizations; instead, quickly get started with the extensive database of commonly used materials, or use standard test data to easily characterize new materials and add the results to the database.



Matrix failure on a pin loaded bracket



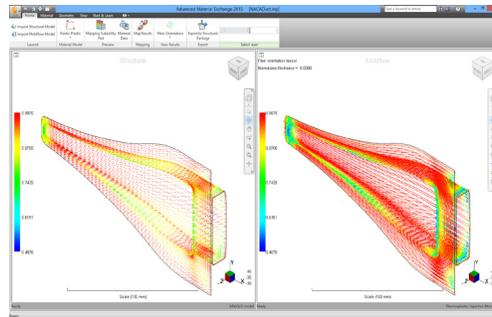
Simulated damage pattern

Fatigue analysis

Composite materials have many advantages, one being their resistance to fatigue. Helius PFA works with conventional FEA software to simulate the progressive fatigue response of composite structures. Even after multiple applied cycles, information about both the damaged state and the ultimate fatigue life of the structure is provided—allowing you to make more in-depth decisions earlier in the design process.

Multiscale analysis

Using a multiscale approach, Helius PFA gives you the ability to initiate and view damage effects at the constituent fiber and matrix level, supporting identification of multiple modes of damage and the resulting composite responses. Together, these capabilities support physically realistic damage initiation and propagation in your finite element analysis.



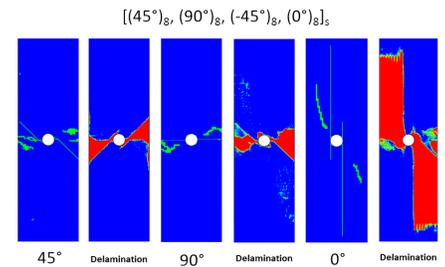
Fiber orientation mapping.

Delamination

Delamination creates separation between plies, stopping all load transfer between those plies, which can significantly affect the failure mode of a structure. Helius PFA helps predict intra-ply and inter-ply failure simultaneously by simulating the effect of delamination, giving you a more accurate understanding of both the load path and the best options for its modification.

As-manufactured simulation

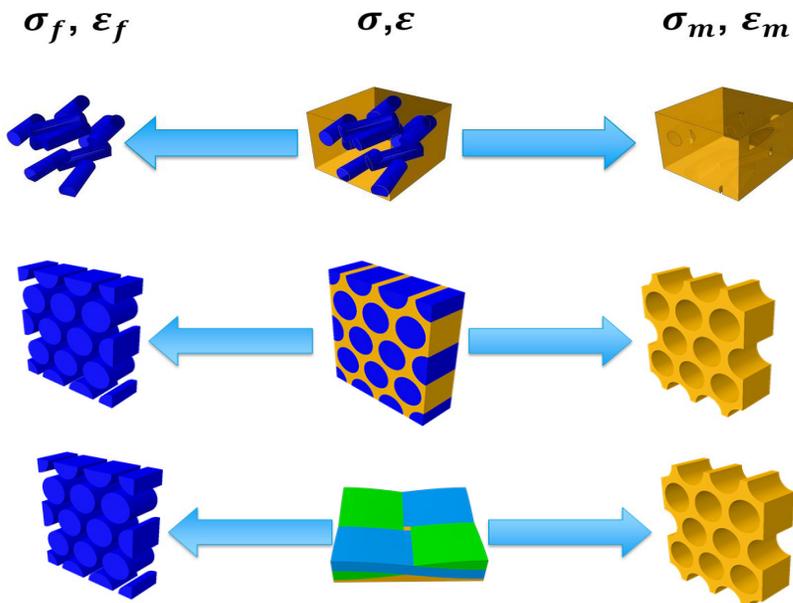
Understand the structural analysis of your fiber-filled parts and identify material nonlinearity and failure early in the design cycle. Transfer manufacturing simulations to structural simulations and map material data and fiber orientations from Autodesk Moldflow simulation software to your Abaqus structural model. Use the information to conduct a more accurate simulation of the fiber-filled material, including predicting material nonlinearity from plastic deformation and simulating matrix cracking during the structural analysis.



In-plane and delamination failures for an open holed tension coupon.

Mesh sensitivity

Take advantage of the energy-based material degradation evolution model to help control the rate of material degradation for your composite structure. Adjust your effective strain measure to eliminate much of the mesh dependency and support understanding of global failure prediction.



Initiate and propagate damage at the fiber matrix level.

Autodesk Digital Prototyping is an innovative way for you to explore your ideas before they're even built. It's a way for team members to collaborate across disciplines. And it's a way for individuals and companies of all sizes to get great products to market faster than ever before. From concept through design, manufacturing, marketing, and beyond, Autodesk Digital Prototyping streamlines the product development process from start to finish.

Learn more or purchase



AMS CAD + CAFM Solutions
271 Route 46 West, Bldg 2
Fairfield, NJ 07004
(973)882-8008

<http://www.amscad.com>

Autodesk Education

Autodesk offers students and educators a variety of resources to help ensure students are prepared for successful design careers, including access to free* software, curricula, training materials, and other resources. Anyone can get expert guidance at an Autodesk Authorized Training Center (ATC®) site, and validate skills with Autodesk Certification. Learn more at www.autodesk.com/education.

Autodesk Subscription

Autodesk® Subscription gives you a greater advantage with powerful cloud-based services, access to the latest software, online technical support, and flexible licensing privileges.** Learn more at www.autodesk.com/subscription.

Autodesk 360

The Autodesk® 360 cloud-based framework provides tools and services to extend design beyond the desktop. Streamline your workflows, effectively collaborate, and quickly access and share your work virtually anytime, from anywhere. Learn more at www.autodesk.com/autodesk360.

*Free products are subject to the terms and conditions of the end-user license agreement that accompanies download of this software.

**All Subscription benefits are not available for all products in all geographies. Please consult your Autodesk reseller or sales representative for more information.

Autodesk, the Autodesk logo, ATC, and Moldflow are registered trademarks or trademarks of Autodesk, Inc., and/or its subsidiaries and/or affiliates in the USA and/or other countries. All other brand names, product names, or trademarks belong to their respective holders. Autodesk reserves the right to alter product offerings and specifications at any time without notice, and is not responsible for typographical or graphical errors that may appear in this document.
© 2015 Autodesk, Inc. All rights reserved.