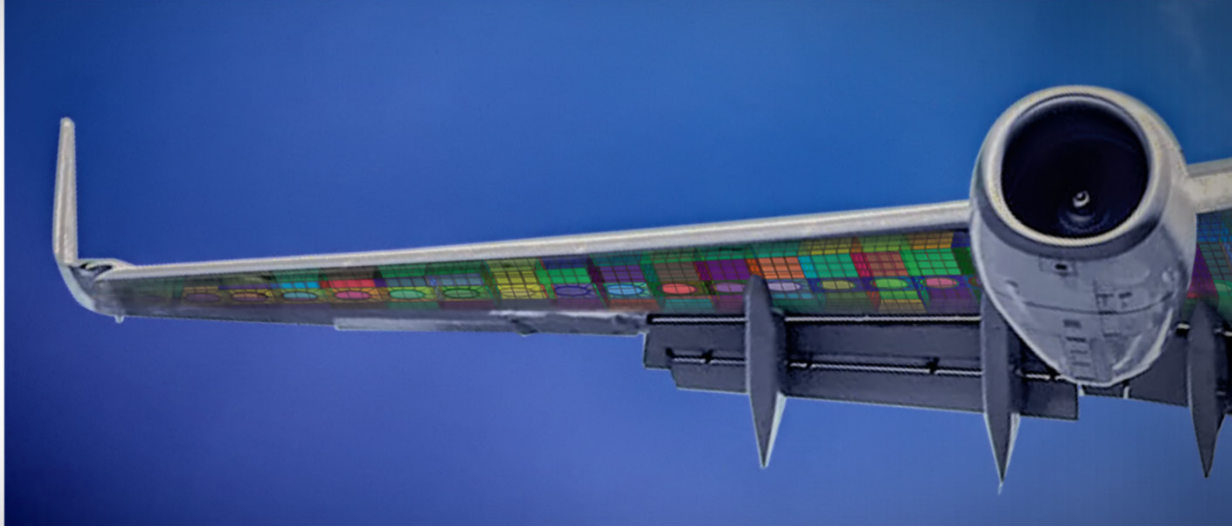
HyperSizer®

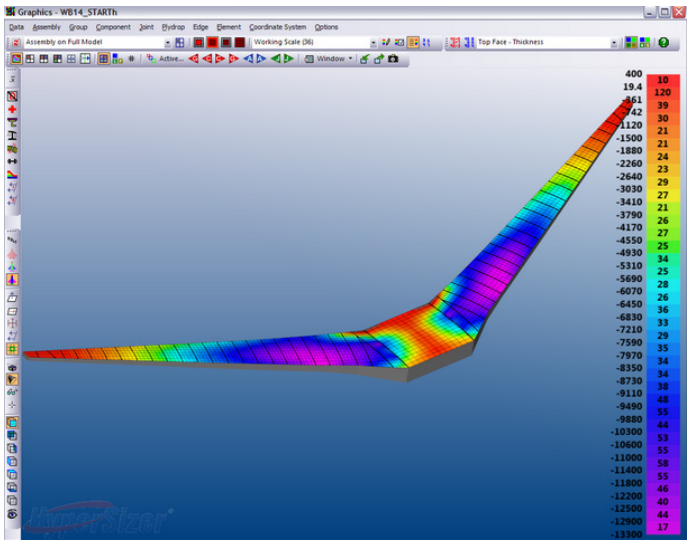
DESIGN | ANALYZE | OPTIMIZE



What Is HyperSizer?

HyperSizer® is Design, Analysis, and Optimization Software for Composite and Metallic Structures

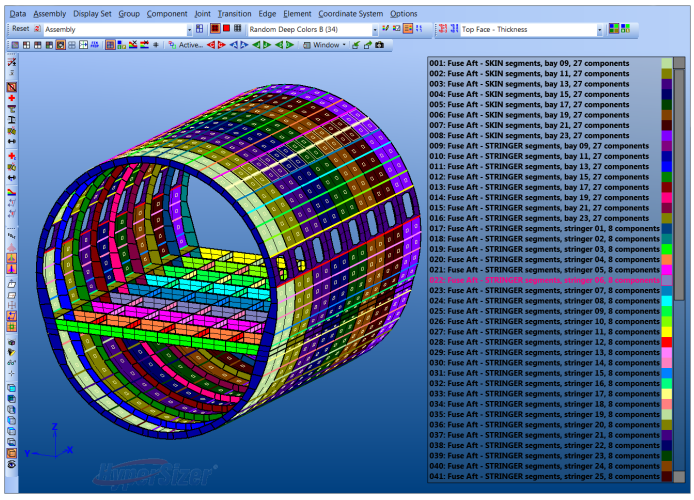
HyperSizer is used throughout the design process--including certification--to quantify all critical failure modes, reduce structural weight, and sequence composite laminates for fabrication to avoid unexpected design problems and weight growth as the design matures. It provides a complete CAE software interface that is used from preliminary design to final analysis. The unified software standardizes the design process by automating the following tasks:



Preliminary Design Optimization, specializing in airframe fuselage, wing, and engine structures. Complete structures are modeled in HyperSizer with panel and beam concepts that are mapped directly to the finite element model on import.

Final Analysis Margins of Safety Calculations, automating hundreds of industry standard failure analyses to evaluate the strength and stability of entire airframes to thousands of user-defined load cases.

Stress Report Documentation, for all failure modes that includes the analysis methods and calculations required for FAA airworthiness certification. Summary tables, in Word, of controlling margins, load sets, and failure modes are included. Detailed analysis data is generated in Excel spreadsheets.



Test Data Validation, correlating failure analyses to test data by simply defining the load at which the test specimen failed. By integrating the test data failure loads with the analytical predictions, engineers are able to quickly establish and permanently maintain the record of prediction accuracy.

Graphically represented by unique color regions on the FEM, finite elements are grouped together to represent skin and stringer into panel segments that share the same cross sectional dimensions and materials systems. Then HyperSizer performs sizing optimization to determine the lightest weight combination of material systems and cross sectional geometric dimensions (panel height, stiffener spacing, etc.) including layup ply angles and stacking sequences. Laminate optimization includes real-world manufacturing constraints that ensure designs are manufacturable by minimizing ply drops across sizing component boundaries and identifying and reducing the number of ply part numbers and process steps.

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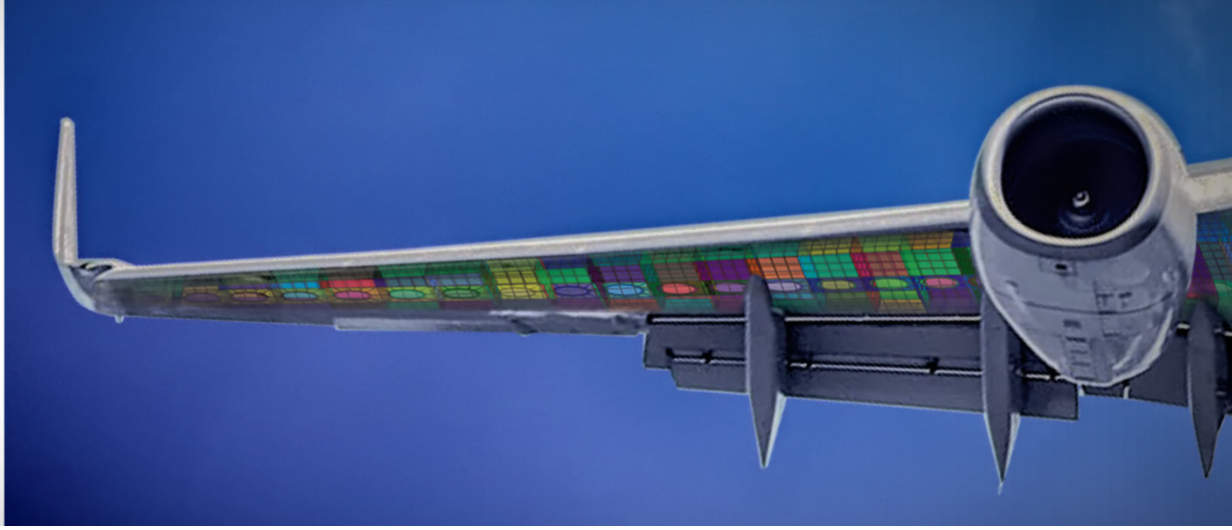


What It Does

HyperSizer Extends the Capabilities of Your Existing Software

Whether using CAD, a finite element modeler, or FEA, use HyperSizer with these tools to achieve a realistic, fully-optimized, manufacturable design and eliminate costly hours of manual calculations and spreadsheets.

Use HyperSizer to standardize your company's analysis with best in class verified and validated methods. Since the same analysis methods are used from preliminary to final design, there are no surprise negative margins of safety that would detrimentally affect your schedule or cause weight growth.

- Reduce structural weight by more than 20%.
- Increase productivity by automating the types of airframe structural analyses that are performed.
- Reduce design cycle time and engineering effort while also evaluating millions of panel and beam cross sections. No remeshing is required.
- Certify structures faster by analyzing hundreds of industry standard failure methods, generating complete documentation for FAA certification, and providing a test database for test data validation.

The HyperSizer Process

Import a Finite Element Model from your existing FEA tool.

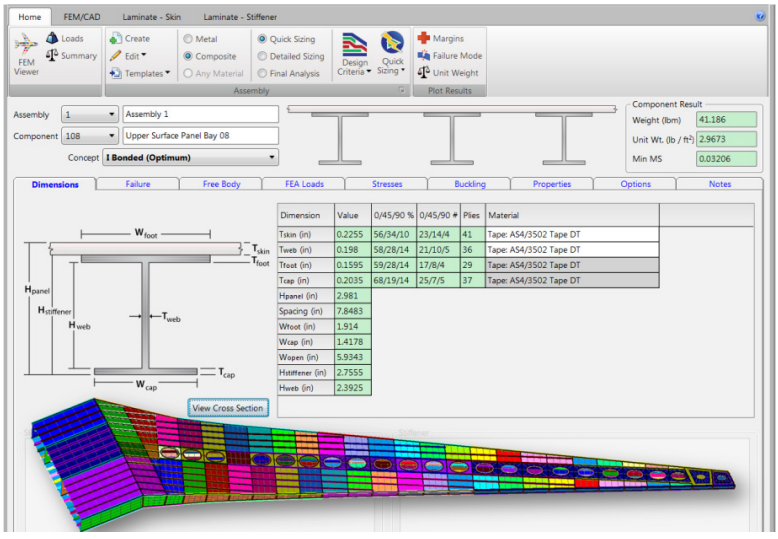
Optimize the panels and beams to resolve all negative margins of safety for your selected analysis methods.

Design composite structures for strength, stability and manufacturability by following HyperSizer's composite optimization process. Use this process to find the optimum ply coverage and end-of-ply transition zones on the part surface, solve for ply count compatibility across the zones, and sequence the global ply ordering to reduce weight and minimize ply drops.

Iterate with FEA automatically with HyperFEA® which executes the solver and controls iterative convergence. After HyperSizer has optimizes the design of the vehicle, thermoelastic stiffness terms are imported to the FEM for another iteration of computed load paths.

Integrate with your company's established analysis methods using plug-ins to integrate legacy codes into HyperSizer. Use COM to execute HyperSizer externally from applications such as Excel, Matlab, and integrated environments such as ModelCenter and Isight.

Generate stress reports that include the calculations for all HyperSizer-computed margins of safety, material properties, design-to loads, optimum design dimensions, etc. These comprehensive engineering reports are used for FAA certification and to support the hardware throughout its life cycle.



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