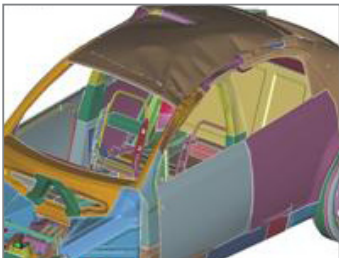
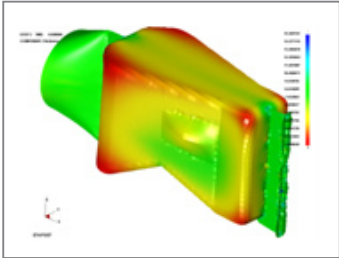


Engineering Consulting Services



"The folks at Red Cedar are professional, intelligent, and exciting to work with. With their help, we were able to optimize an extrusion design by reducing mass significantly further than with traditional CAE methods."

- Dan Casey, P.E.
Senior Applications Engineer
Steelcase, Inc.

Innovative Solutions to Your Engineering Problems

The HEEDS Design Exploration Team provides CAE design, analysis and design exploration services that give your company a competitive advantage in a crowded market.

The design and manufacture of new products requires development teams to satisfy a myriad of conflicting objectives, including rapid increases in design complexity, performance requirements, time-to-market demands, and material costs.

Additionally, in today's tightening economy, maintaining a full range of in-house engineering expertise is not cost-effective for many companies. But failing to improve products and processes is not acceptable either. HEEDS Design Exploration Team's engineering services provide the latest technology and expertise required to achieve innovative designs while significantly reducing product development time and cost.

Our Services

Our consulting services include computer-aided engineering (CAE) modeling, finite element analysis, design exploration, and software customization – from the concept stage through final design.

CAE Modeling and Analysis

Advanced finite element modeling and simulation of linear and nonlinear systems and manufacturing processes. High-fidelity computer models are used to provide insight into the mechanical, thermal, fluid and acoustic behavior of your products and processes.

Design Exploration

Multidisciplinary and multi-objective optimization of linear and nonlinear systems and manufacturing processes.

Exclusive automated search technology is used to explore the design space and identify improved solutions to your most challenging design problems, improving performance and quality while reducing mass and cost.

Application Customization

Specialized software design tools customized to your applications and workflow processes. By capturing and automating your workflow for CAE analysis and design exploration, these customized tools drastically increase the productivity of your engineering teams.

Benefits

By taking advantage of our decade of experience and exclusive design exploration technology, engineering teams can:

- **Identify innovative solutions** to challenging engineering problems, with emphasis on superior performance, robustness, and cost savings.
- **Develop more efficient designs** that use less material and are easier to manufacture.
- **Achieve significant productivity gains** in the design of their engineered products and processes.
- **Attain a competitive market advantage** by compressing the time to develop superior product designs.
- **Eliminate overhead** by working with a trusted resource for engineering expertise and services.

Sample Projects

Aerospace

- Composite wings
- Landing gear
- Wing profile design
- Fuselage structures
- Composite joint layout

Automotive

- Body and chassis durability
- Suspension systems
- Crashworthiness (frontal, rear, side, poll, roll-over)
- Hybrid electric powertrains
- Bushings
- System and component crash and NVH
- Armored vehicles
- Seat systems
- Exhaust systems
- Pistons, rings and gears
- Bumper systems
- Closure systems

Biomedical

- Orthopedic implants
- Vascular stents

- Surgical devices
- Biomaterials modeling
- Consumer products
- Press fits
- Racing head and neck support (HANS)

Civil

- Composite manhole covers
- Truss and frame mass optimization
- Bridge deck design

Durable Goods

- Plastic and metallic containers
- Food manufacturing equipment
- Golf clubs and balls
- Shoe design
- Transport equipment
- Packaging

Energy

- Hybrid electric powertrains
- Chemical process energy usage minimization

Manufacturing and Processing

- Injection molding
- Stamping
- Forging
- Hydroforming
- Weld design
- Blow molding
- Chemical processing

Materials

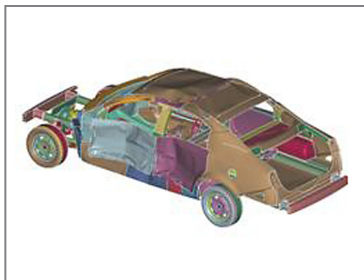
- Composite layout design
- Material selection
- Material model calibration
- Material property
- Material identification
- Redesign for material conversion

More Information

To learn more about how our consulting services can help your team gain that competitive advantage, please contact us at: 517.664.1137 or info@redcedartech.com.

Client Success Stories

Companies worldwide trust their most important engineering design projects to the HEEDS Design Exploration Team at Siemens PLM Software. Our engineering expertise and unique design strategies are used worldwide by product development teams to design safer cars, life-saving cardiovascular stents, innovative structures for air travel and space exploration, robust manufacturing processes and much more.



Passenger Safety Compartment Design Exploration

Decreased mass in safety cage by 23%.

Coronary Stent Shape Optimization

Reduced maximum principal strain by a factor of three.

Design of a Composite Wing

- Reduced failure index by 30%
- Reduced deflection by 15%
- Increased buckling load by 80%
- Increased mass by 6%

Seat Frame Design Exploration

Reduced mass by 10% and reduced cost by 12% compared to a competitor's optimized design.

Hydroformed Lower Rail

- Reduced peak force by 30%
- Increased energy absorption by 100%
- Reduced weight by 20%
- Resulted in an overall crash response equivalent of five star rating

"The collaborative efforts between NVH Solutions and the engineers at Red Cedar Technology have produced truly innovative composite and elastomeric designs that have exceeded our customers' expectations for both performance and cost. We continue to work with Red Cedar Technology because of their in-house engineering expertise and because we trust them to handle every project on time, on budget and with the highest level of professionalism, quality and efficiency."

- Scott A. Wellman,
President, NVH Solutions

SIEMENS
Ingenuity for life