

# Finite Element Analysis (FEA)

IMAGINiT provides an effective collaborative consulting business model to deliver Finite Element Analysis (FEA) services to support confident design decisions. The insight we offer empowers clients to create robust designs faster and more reliably, without distractions to their current development process.

## Our consulting model is built on leveraging strengths

By partnering with IMAGINiT, the analysis process is handled by our analysis experts, while the design process is left to your design experts. Sharing core competencies encourages continuous collaboration and bi-directional flow of information. This ensures that all design guidance and ideas exchanged fit within your constraints for timing, cost, manufacturability, size, and aesthetics.

## Benefits of IMAGINiT's insight:

- Assess performance effectiveness before making tooling commitments
- Increase design efficiency and product reliability
- Optimize performance-to-weight ratios
- Balance overall performance with size, cost, and aesthetics
- No need for FEA expertise or software—We have it!

## Initiatives impacted:

- **Cost Control** – mitigating overdesigning, redundancy, and costly rework
- **Time to Market** – reducing exploratory testing with greater confidence
- **Differentiation** – substantiating performance claims
- **Compliance** – achieving specifications with better designs the first time
- **Brand Recognition** – introducing superior products ahead of the competition

## Why do companies partner with IMAGINiT?

**Design Insight.** Our team provides impactful design insight for understanding how to fix a problem or innovate new and better performing products without diverting internal engineering resources.

**Analysis Expertise.** Our team has built careers around FEA & CFD analysis and has the expertise to confidently gain and interpret results which empowers our clients to make informed design decisions and meet critical project deadlines.

**Preserve Design Intent.** Our process is highly collaborative and leverages the strengths of both IMAGINiT and our clients. The combination of focused core competencies and frequent design review meetings ensures that we are always in lock step with your objectives to preserve the original design intent. IMAGINiT works as extension of your team.

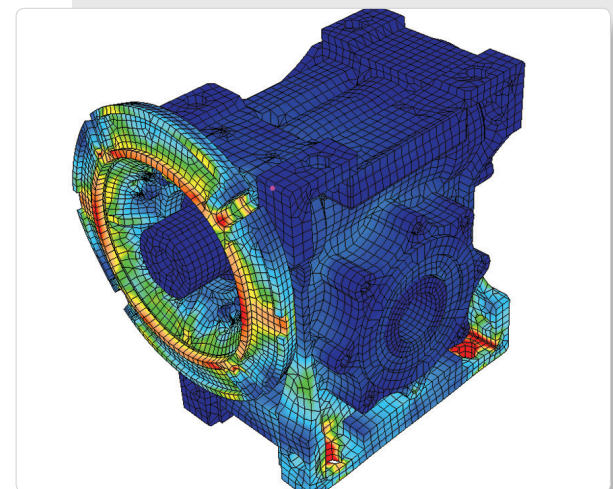
## Application Areas:

- AEC
- Aerospace
- Automotive
- Chemical Processing
- Consumer Products
- Electronics
- Energy
- Government/Defense
- Industrial Equipment
- Marine
- Medical
- Power Generation
- Semiconductor
- Telecommunications

Contact us today for a free project scoping assessment.

T: 434.202.8989

E: [simulation@rand.com](mailto:simulation@rand.com)



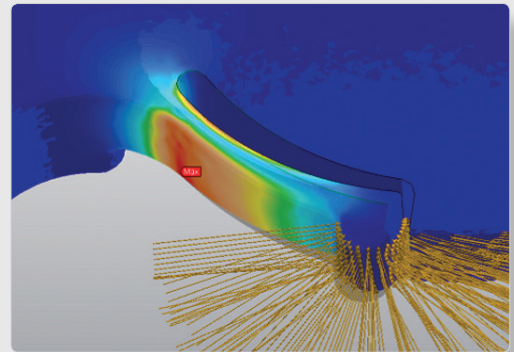
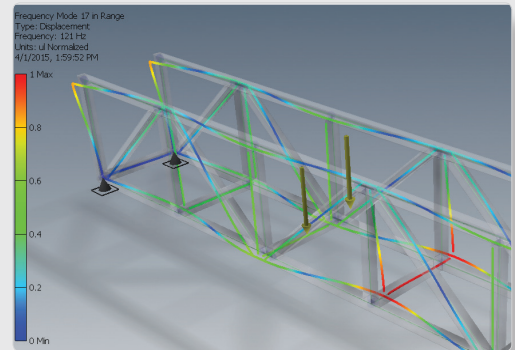
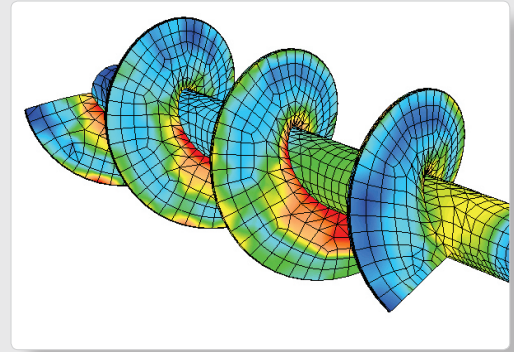
## IMAGINiT's FEA Capabilities

IMAGINiT's FEA Consulting team has extensive experience with multibody systems.

- **Structural modeling (linear deflection).** Our experts understand static stress conditions, bolted assemblies, bending moments, shear forces, as well as tensile and compressive stress.
- **Modal analysis.** We can analyze resonant frequencies and mode shapes for systems.
- **Shock response modeling and simulation.** Examples include drop shock and crash safety.
- **Random vibration.** In this area, our team has experience with power spectral density input.
- **Fatigue analysis.** Past projects have covered Miner's Rule and S-N Curve.
- **Parametric design studies and design optimization.**
- **Thermal induced stress conditions.**

IMAGINiT's team works on a wide variety of FEA projects, such as:

- ▶ Pre-stressed PSD random vibration of electronics PCB assembly
- ▶ Building wind loads coupled from CFD analysis results
- ▶ Drop test simulation for products and devices under multiple test orientations
- ▶ Stress and vibrational modeling for aircraft modifications and customizations (e.g., drop shock, saw tooth shock profiles, vibration ground vehicle and flight environments)
- ▶ Stress analysis of electronic chassis and opto-mechanical systems and components for rugged environments



## About IMAGINiT Technologies

IMAGINiT Technologies, a Rand Worldwide Company, is the world's largest provider of enterprise solutions to the engineering community, including the building, manufacturing, civil and mapping industries. With over 25 years of experience, and 45 offices throughout North America, we provide the expertise, training and support to help companies realize the full power of design technology, maximize ROI and gain competitive advantage.