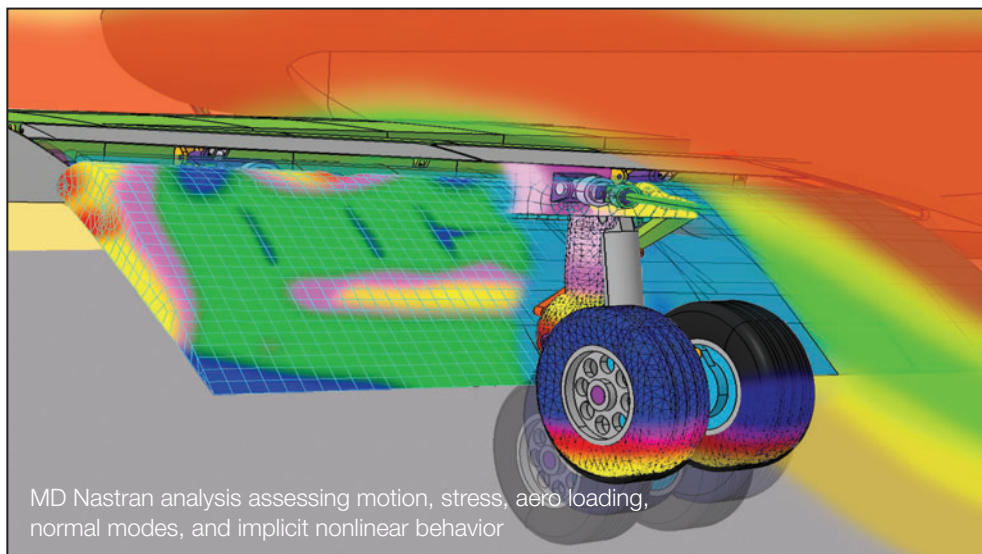


# MD Nastran

## Multidiscipline Simulation System for Advanced Engineering Analysis



### MD Nastran

Leading manufacturers around the globe have relied on MSC's core Nastran technology to bring new products to market for over four decades. Now, MD Nastran (MD for "multidiscipline") brings engineers an expanded arsenal of analysis capabilities founded on MSC's legacy of technical leadership and field-proven reliability. A complete simulation system for advanced engineering analysis, MD Nastran delivers the most complete portfolio of integrated simulation and analysis technologies available anywhere.

### Multidiscipline Value

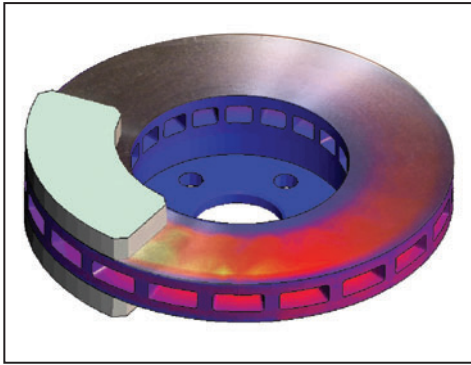
The value of a multidisciplinary approach goes far beyond an extensive set of analysis capabilities. MD Nastran is optimized across multiple, integrated disciplines with the power to handle large-scale problems and take maximum advantage of current high performance computing environments. MD Nastran's multidisciplinary focus accelerates cross-the-board efficiency improvement by driving early design validation, improved product performance, and rapid insight into product lifecycle performance.

### Capabilities

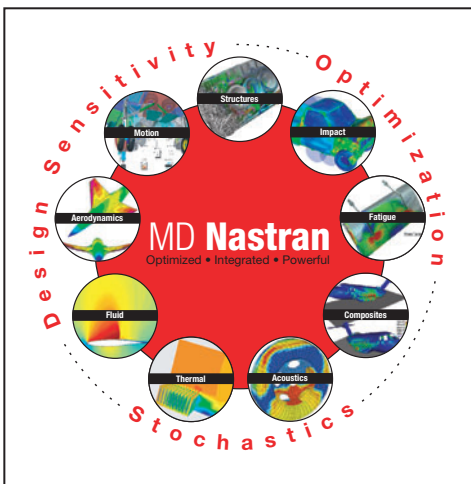
- Strength and fatigue of an aircraft fuselage, wings and flaps, and landing gear.
- Strength durability and vibration of the various structures (body, chassis, suspension, steering, and wheels) of a car, a truck, or a train.
- Effects of temperature fluctuations from convection, conduction, advection and radiation in consumer electronic devices, such as a television or a cell phone.
- How a product holds up to a catastrophic event, such as dropping onto the floor, crashing into a brick wall, or falling from a crane.

### Benefits

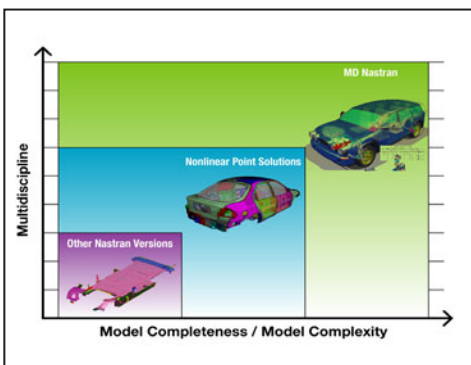
- Accelerate time-to-manufacturing by leveraging MD Nastran's common data model to perform staggered, coupled, or discrete analysis across more new product development disciplines than any alternative offering
- Drive manufacturing cost down by moving simulation technologies to the front of the new product development cycle
- Explore more design alternatives, predict system-level functional performance, and accurately assess lifecycle service (safety, fatigue, durability) issues before making costly manufacturing commitments
- Eliminate silos of expertise, reduce dependency on disconnected point solutions, and vastly improve analyst efficiency by managing all required simulations in a single, consistent usage environment
- Save time, eliminate or reduce modeling idealization, and vastly improve real-world correlation by taking advantage of MD Nastran's high-performance computing, advanced state-of-the-art solver technology, and special capabilities for large/complex simulations



**Hydraulics, contact, friction, thermal, nonlinear, and modal effects from a common data model**



**Manages critical interactions between multiple, integrated engineering domains**



**Optimized for large assembly modeling in high performance computing environments**

**Corporate**

MSC Software Corporation  
2 MacArthur Place  
Santa Ana, California 92707  
Telephone 714 540 8900

www.mscsoftware.com

**Optimized**

- Performance optimized for large systems and complex analyses
- New, highly-tuned, state-of-the-art solvers save time and enable exploration of a broader range of design alternatives
- Built-in shape and topology optimization combined with stochastics capability contribute to overall design efficiency and lifecycle performance predictability

**Integrated**

- Easily handles a multitude of increasingly complex simulations from linear to nonlinear to post-failure, and more in a common usage environment
- Coupled multidisciplinary and linear/nonlinear analysis accounts for critical interactions when multiple environmental effects occur simultaneously or over time
- Common data model minimizes time wasting and error-prone model translations and analysis model preparation tasks common to point solution environments

**Powerful**

- Readily handles large, interconnected assemblies with an array of specialty connectors, advanced 3D contact with friction ability, flexible and rigid component support, and superelements
- ILP 64-bit support eliminates model size constraints due to physical memory addressability limits that continue to handicap other systems
- Parallel computing/multi-processor enabled, new - high-performance sparse and iterative solvers, and large model support capabilities

**Europe, Middle East, Africa**

MSC Software GmbH  
Am Moosfeld 13  
81829 Munich, Germany  
Telephone 49 89 431 98 70

**MD Nastran: Multidisciplinary Value:**

- System-oriented view drives rapid insight into overall design performance
- Common usage environment and data model highlight design flaws faster
- Simulation of complex interactions within and across engineering disciplines offers insight into real-world design behavior earlier in the new product design cycle
- Broad, integrated discipline coverage exposes manufacturing and process-related problems sooner to circumvent costly and delay-inducing manufacturing rework

**MD Nastran includes:**

- Linear Statics
- Normal Modes
- Buckling
- Connectors
- Dynamics
- Heat Transfer
- Adams integration
- Unlimited Model Size
- Aeroelasticity I
- Direct Matrix Abstraction Programming (DMAP)
- Dynamic Design Analysis Method (DDAM)
- Shared Memory Parallel (SMP)
- Implicit Nonlinear
- Implicit Nonlinear Shape Memory Materials
- Implicit Nonlinear Hemi Cube View Factors

**Complementary MD Nastran Modules**

- Distributed Memory Parallel (DMP)
- Automated Component Module Synthesis (ACMS)
- Interior Acoustics
- Exterior Acoustics
- Aeroelasticity II
- Design Optimization
- Krylov Solver
- Rotor Dynamics
- Superelements
- Topology Optimization
- Explicit Nonlinear
- Implicit Nonlinear Multi-Processor
- Explicit Nonlinear Multi-Processor

**Asia-Pacific**

MSC Software Japan LTD.  
Shinjuku First West 8F  
23-7 Nishi Shinjuku  
1-Chome, Shinjuku-Ku  
Tokyo, Japan 160-0023  
Telephone 81 3 6911 1200