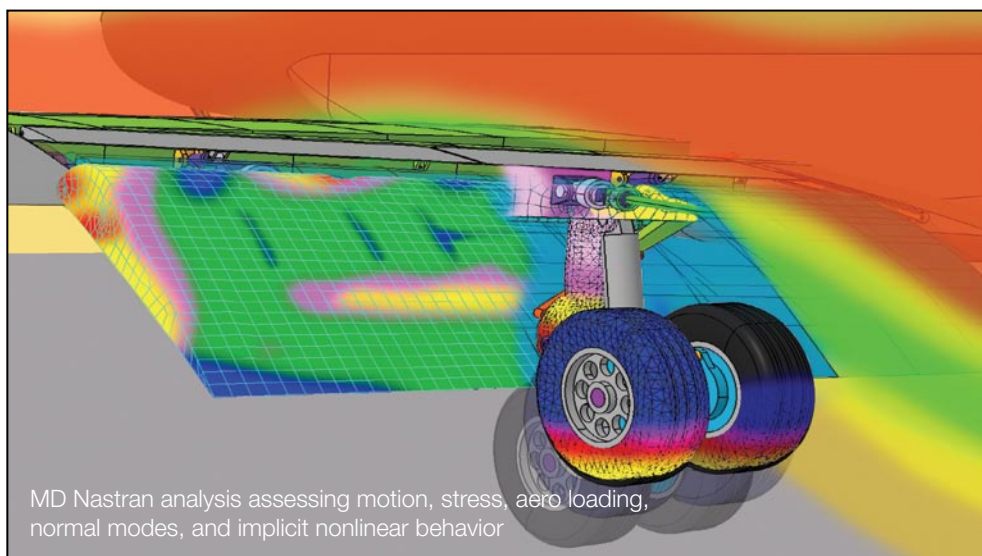


MD Nastran

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 across-the-board efficiency improvement by driving early design validation, improved product performance, and rapid insight into product lifecycle performance.

Benefits

Improved Engineering Productivity by unifying silos of expertise, reduce dependency on disconnected point solutions, and vastly improve analyst efficiency by enabling and managing a broad range of multidisciplinary analysis

Accelerated Time-To-Market with rapid insight into overall design performance enabling reductions in the time-to-solution cycle up to 50%.

Reduced Manufacturing Costs by accurately predicting and correcting the design behavior much earlier in the design cycle.

Optimal Product Quality and Lower Warranty Costs with precise representation of complex interactions between disciplines, enabling better design decision and eliminating unexpected operational faults during use.

Capabilities

- Advanced integrated nonlinear multi-step static and transient nonlinear analysis
- Extend linear models to simulate nonlinear behavior including contact, material nonlinearity and failure models to simulate crack and delamination
- Industry proven contact to simulate component assemblies, validate product performance & drop test
- Account for thermal loads from convection, conduction, contact, advection and radiation
- Automated Component Modal Synthesis for large modal based analyses and NVH solutions
- Frequency response functions (FRFs) reveals how excitations on one component effect responses at other components in the assembly
- Simulation of Interior and Exterior Acoustics for sound pressure inside a bounded domain or a vibrating structure
- Perform analysis of structures with rotating components
- Include the effects of aeroelasticity on structures
- Combined topology, sizing, and, shape optimization with manufacturing constraints
- Introduce random model variations for stochastic simulation
- Fluid-structure interaction for Airbag and Occupant Safety
- Noise, Vibration & Harshness solutions based on explicit transient events

Optimized

- Performance optimized for large scale systems, assemblies, dynamics and NVH simulations
- New, highly-tuned, state-of-the art solvers save time and enable exploration of a broader range of design alternatives
- Built-in sizing, shape and topology optimization combined with stochastic simulation capability contribute to superior design and overall design process efficiency
- Supports the Microsoft Compute Cluster and other high performance computer architectures

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 eliminates error-prone model translations and minimizes 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

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
 - Contact in linear and nonlinear solutions
 - Advanced integrated multi-step nonlinear static and transient
 - Receptor Parts (FRFs)
- Normal Modes
- Buckling
- Connectors
 - Composite Beam using VABS
- 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

- Explicit Nonlinear with Fluid-Structure Interaction
- Cohesive Failure Elements
- Virtual Crack Closure Technique (VCCT)
- CASI iterative solver
- 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

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