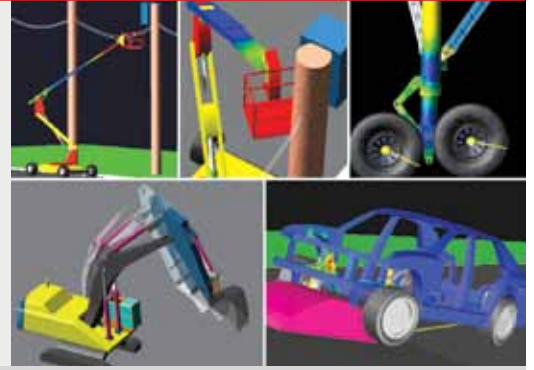


# MD Adams

## Real Dynamics for Engineered Systems



### MD Adams

Adams is the world's most widely used multibody dynamics simulation software. It lets you build and test virtual prototypes, realistically simulating on your computer, both visually and mathematically, the full-motion behavior of your complex mechanical system designs.

MD Adams (MD for "multidiscipline") brings even more powerful analysis capabilities founded on MSC's legacy of technical leadership and field-proven reliability. MD Adams is part of MSC. Software's complete portfolio of integrated simulation technologies for advanced engineering analysis.

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

### Business Value

- **Improve Engineering Productivity:** Enable efficient communication between various groups of expertise, reduce your dependency on disconnected point solutions, and improve analyst efficiency.
- **Accelerate Time-To-Market:** Gain faster, better insight into overall system design performance.
- **Reduce Manufacturing Costs:** Accurately predict and correct the design behavior much earlier in the design cycle. Achieve an optimal design by analyzing multiple design variations faster.
- **Achieve Lower Warranty Costs:** Predict system-level functional performance, and accurately assess lifecycle service (safety, fatigue, durability). Reduce risk by having better information at every state of vehicle design and development.
- **Drive Innovation:** Explore several design concepts quickly and efficiently

### MD Adams Package Modules

The following modules enhance the capabilities of MD Adams by allowing the simulation of systems ranging from simple to sophisticated.

#### MD Adams/Solver

MD Adams/Solver is the powerful, high-performance analysis engine that forms the core of the product continuously developed and improved for over three decades.

#### MD Adams/View

MD Adams/View is an easy to use graphical interface to MD Adams/Solver functionality. View enables you to import CAD files and build models. MD Adams/View also has capability to automate many repetitive tasks saving valuable time. You can also create templates and tools for a customized solution.

#### MD Adams/PostProcessor

MD Adams/PostProcessor provides you a comprehensive result post-processing environment. Powerful animation, plotting and reporting functionality are all available to effectively investigate and present your simulation results.

### Capabilities

- Creation or import of component geometry in wireframe or 3D solids
- Extensive library of joints and constraints to define part connectivity
- Definition of internal and external forces on the assembly to define your product's operating environment
- Model refinement with part flexibility, automatic control systems, joint friction and slip, hydraulic and pneumatic actuators, and parametric design relationships
- Ability to iterate to optimal design through definition of objectives, constraints, and variables
- Automatic generation of linear models and complex loads for export to structural analyses
- Element level model export to Nastran supporting both static and dynamic operating points via Adams2Nastran
- Comprehensive and easy to use contact capabilities supporting 2D and 3D contact between any combination of modal flexible bodies and rigid body geometry
- Comprehensive linear and nonlinear results for complex, large-motion designs

### High Performance Computing (HPC)

- 64-bit support on Windows and Linux platforms
- Parallel processing support for MD Adams/Tire results
- Shared Memory Parallel solver

### MD Adams/Flex

MD Adams/Flex allows the incorporation of component flexibility within your full-system simulations. Adding flexibility provides better insight into the behavior and life of your designs, allowing you to deliver higher quality products faster. MD Adams/Flex allows the use of existing linear FE models and is tightly integrated with Nastran and Patran.

### MD Adams/Durability

MD Adams/Durability extends the capability offered by MD Adams/Flex to recover stresses on flexible bodies. Results from an MD Adams solution are combined with modal stresses from FE to more accurately predict the stress in a flexible body. These stresses and strains can then be used to complete a life/damage calculation with fatigue prediction software such as MSC. Fatigue. The widely used DAC and RPC3 file formats are also supported.

### MD Adams/Vibration

MD Adams/Vibration allows you to study forced vibration of your MD Adams models using frequency domain analysis. MD Adams/Vibration results can be used in NVH studies to predict the impact of vibrations on passenger comfort in an automobile, train, plane or other vehicle. You can also include the effects of controls on the system behavior

### MD Adams/Controls

MD Adams/Controls helps you to easily integrate the worlds of motion simulation and control system design in true multidisciplinary fashion. With this module, you can incorporate your MD Adams models within block diagrams in your preferred control system design software. Alternatively, you can directly import actuators and/or controllers from the controls design software into the MD Adams simulation environment. Currently, MD Adams/Controls support Easy5 from MSC.Software and Matlab/Simulink from The Math Works,

### MD Adams/Mechatronics

MD Adams/Mechatronics allows control systems to be easily incorporated into your system models. It contains modeling elements which transfer information to and from the virtual control system. This means that complete system-level optimization is made easier for complex problems such as shunt-and-shuffle for vehicle design or hydraulic system performance on heavy machinery.

### MD Adams/Exchange

MD Adams/Exchange allows the import or export of common geometry formats into and out of MD Adams. There is no need to recreate model geometry each time you transfer data between CAE tools. Among the supported formats are Parasolid, STEP, IGES and DWG/DXF. When you import a model from your preferred CAD system, you can use the model's geometric features to quickly position forces and constraints for your motion simulation.

### MD Adams/Tire FTire

MD Adams/Tire FTire software is an optional module that can be used to add tires to your mechanical model and to simulate maneuvers such as braking, steering, acceleration, free-rolling, or skidding. It lets you model the forces and torques that act on a tire as it moves over roadways or irregular terrain. You can use MD Adams/Tire to model tires for either vehicle-handling, ride and comfort, and vehicle durability analyses.

### MD Adams/Insight

MD Adams/Insight is a powerful aid for design refinement. It allows you to determine the sensitivity of output objectives to key model parameters by launching simulations for several design variants defined by a variety of design-of-experiments (DOE) methods. These simulation results are used to construct a response surface which MD Adams/Insight can help you assess and improve. With that response surface, MD Adams/Insight can publish an interactive html page where non-CAE experts within your organization can quickly and confidently perform what-if studies viewing the relationship between input parameters and important design objectives.

### MD Adams Basic Package Includes:

- MD Adams/View
- MD Adams/Solver
- MD Adams/Postprocessor
- MD Adams/Insight
- MD Adams/Exchange
- MD Adams/Linear
- Shared Memory Parallel (SMP)

### MD Adams Advanced Package Includes:

- MD Adams/Flex
- MD Adams/Durability
- MD Adams/Vibration
- MD Adams/Controls
- MD Adams/Mechatronics

### Optional Modules:

- MD Adams/Car Package
- MD Adams/Tire FTire

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