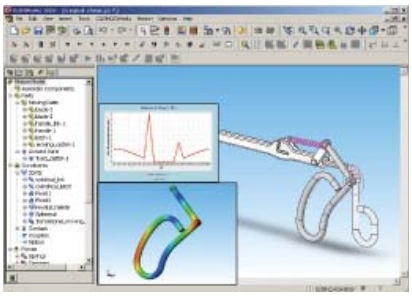
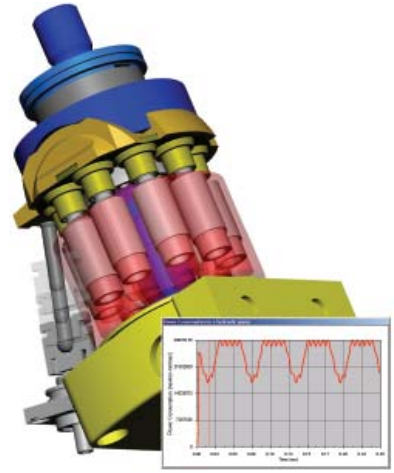
COSMOSMotion OVERVIEW

KINEMATICS AND DYNAMICS SIMULATION FULLY INTEGRATED WITH SOLIDWORKS 3D CAD SOFTWARE

COSMOSMotion™ is a complete, functional, virtual prototyping package for SolidWorks® users. Powered by ADAMS® technology, the industry leader for over 20 years, COSMOSMotion contains all the functionality required to make sure your designs will work before you build them.



Seamlessly transfer motion loads and joint forces from COSMOSMotion to COSMOSWorks® to perform stress analysis.



Easily size actuators and motors by calculating the power or torque required to operate these mechanisms.

COSMOSMotion simulates the mechanical operations of motorized assemblies and the physical forces they generate. It determines factors such as power consumption, interference between moving parts, and resistance to stress. COSMOSMotion tells designers when their designs will fail, when parts will break, and whether they will cause safety hazards.

Leverage the power of SolidWorks. SolidWorks gives you world-class capabilities to build realistic 3D solid models representing the form of your parts. Creating assemblies of 3D solids allows you to clearly understand whether the parts will fit together. COSMOSMotion lets you understand the function of your design before prototyping any hardware, all within the familiar environment of SolidWorks.

Perform motion simulation quickly and easily. With COSMOSMotion, you first create motion models containing constraints, contacts, forces, and actuators. Then simulate mechanism motion using the most powerful simulation engine in the world: ADAMS. Finally, review animations, plot engineering data, and check for interferences.

Obtain meaningful results. If you are a designer or an engineer interested in understanding the performance aspects of your design before physical prototyping, you need COSMOSMotion. Using animations and XY plots, you will size motors/actuators, determine power consumption, lay out linkages, develop cams, understand gear drives, size springs/dampers, determine how contacting parts behave, generate operating loads suitable for use by COSMOSWorks® design analysis software, and much more. Knowing this information will help you answer two fundamental engineering questions: "Will it work?" and "Will it break?"

Realize significant cost- and time-savings. It is very typical that COSMOSMotion customers recover the cost of the software in the first project. COSMOSMotion customers enjoy quantitative reductions in prototyping costs and reduced product development time. In addition, customers often note qualitative benefits such as the ability to consider more designs, risk reduction, and the availability of valuable information early in the design process.

SolidWorks

COSMOSMotion At A Glance

COSMOSMotion simulates the function of CAD models and outputs the same performance information typically gathered through physical prototypes.

CAD Integration

COSMOSMotion is fully integrated within the SolidWorks Windows®-native environment.

User Interface

- Intellimotion wizard to quickly build motion models
- Intellimotion browser works similar to SolidWorks FeatureManager®
- Drag & Drop simulation
- Uses the mass properties defined in SolidWorks for simulation

Visual Basic® and C++® API Support

- OLE automation to customize motion inputs and results visualization

Bundles

Available as a standalone product or bundled with COSMOSWorks Professional.

Supported Languages

- Chinese
- English
- French
- German
- Italian
- Japanese

System Requirements

- SolidWorks 2004 or higher
- Pentium®- or AMD Athlon™-class processor
- Microsoft® Windows XP Professional or Windows 2000
- 256 MB RAM or greater
- 200 MB disk space or greater
- CD-ROM drive
- Pointing device
- OpenGL hardware graphic support recommended

Motion drivers

Motion can be specified to joints and parts.

- Actuator
- Motor

Motion types

- Displacement
- Velocity
- Acceleration

Motion and forcing functions

- Constant
- Harmonic
- Step
- Data points (spline)
- Expressions as a function of time (any ADAMS functions)

Forces

- Linear and torsion springs
- Linear and torsion dampers
- Action-only force and moment
- Action/reaction force and moment
- Point-to-point impact force
- Bushings
- Gravity

Constraints

Joints. Joints are automatically generated from assembly mates. Joints also support friction.

- Revolute
- Cylindrical
- Spherical
- Universal
- Translational
- Screw
- Planar
- Fixed

Joint primitives. Joint primitives are used to enforce standard geometric constraints. Joint primitives are automatically generated from assembly mates.

- Inline
- Inplane
- Orientation
- Parallel axis
- Perpendicular

Contact or cam constraints

Contact containers provide the user with the ability to have one contact defining the same contact properties between many different bodies simultaneously.

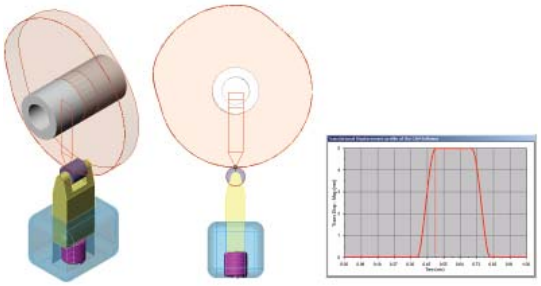
- Point-to-curve 2D contact
- Curve-to-curve 2D contact
- Curve-to-curve 2D intermittent contact (with static and dynamic friction)
- 3D contact (with static and dynamic friction)

Joint couplers (kinematic gears)

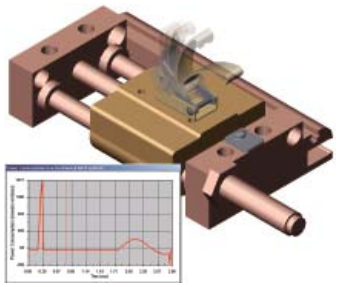
Allow motion of a revolute, cylindrical, or translational joint to be coupled to the motion of another revolute, cylindrical, or translational joint.

Results visualization

- Display displacement, velocity, acceleration, and force vectors on the screen
- Display trace of any point of the body during the simulation
- Animate 3D springs during simulation
- Save animation in AVI and VRML formats for playback
- Dynamic interference checking
- Exports following output results to Excel or text file
  - For parts - displacement, velocity, acceleration, rotation, angular velocity, angular acceleration, kinetic energy, potential energy, momentum
  - For joints - reaction force, reaction moment, projection angles
  - For motors and actuators - power consumed
  - Contact force
- Export inertial loads and joint forces for stress analysis using COSMOSWorks



Determine CAM paths required to achieve the desired motion between two parts.



Calculate the power requirements for a variety of mechanical locking systems.

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