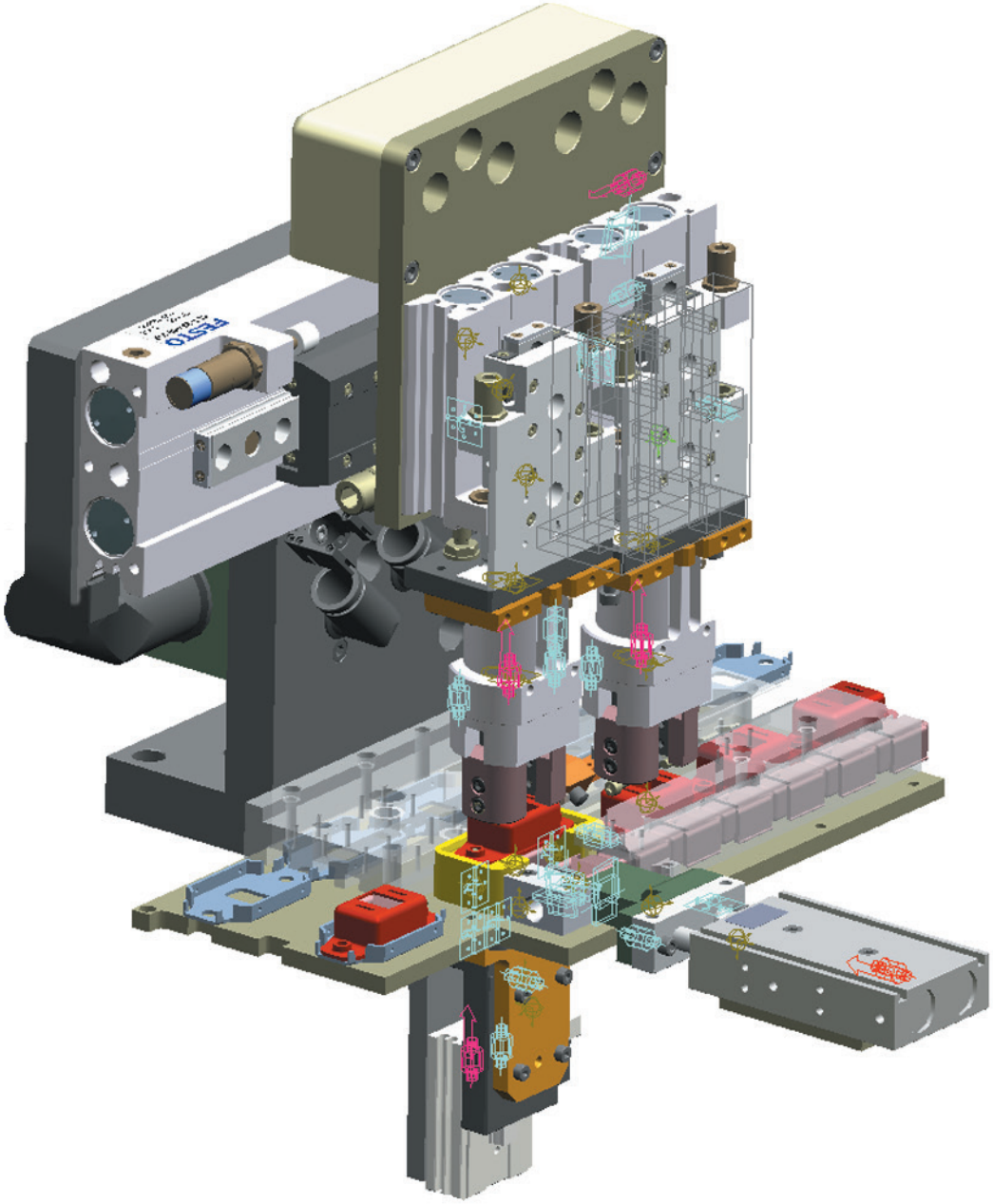
Dynamic Designer

CAD-Embedded Design Validation

for SOLID EDGE



Design Simulation Technologies

Dynamic Designer Motion

Design Validation inside Solid Edge

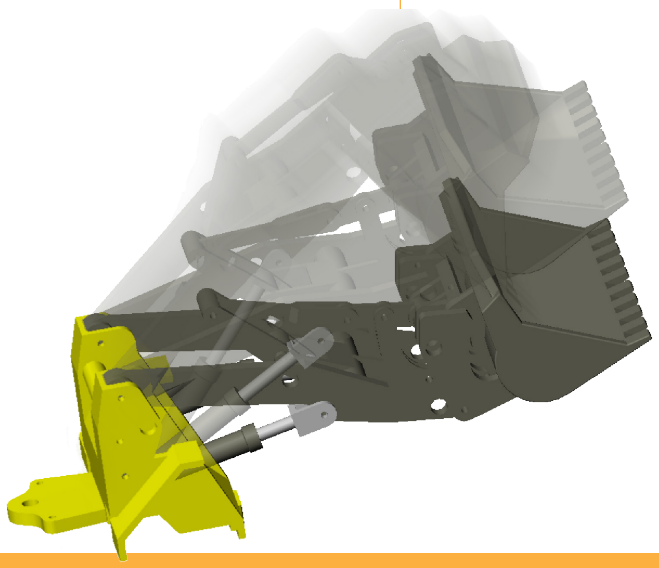
Generating Design Confidence

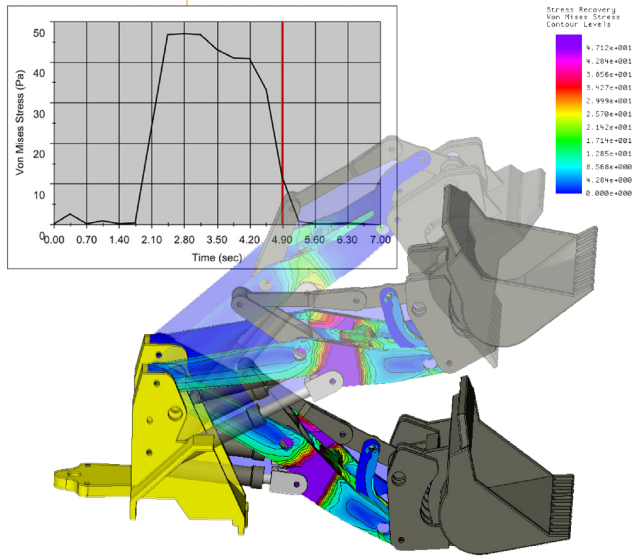
Solid Edge allows you to easily create 3D solid models that help you understand the form and the fit of your design. Once complete, product assembly is easy and frustrating part interferences are now virtually a thing of the past. So everything is perfect, right? Well, not quite. In most situations, you need documented proof that your design will not only work, but withstand a variety of intended (and sometimes unintended) operating conditions. To validate your design, you can perform physical evaluations, either by testing prototypes in a lab, or by field testing the assembled product. No matter which method you choose, each requires several costly and time consuming design changes before you arrive at a design that has both your complete confidence and documented operational proof. There must be a faster, more efficient way.

Evaluate more Product Designs, Faster

What if you could generate the product confidence you want and the operational proof you require inside Solid Edge during the design process? Before you ever create a physical part or perform a physical test, you could see the effects of each design change and the impact they have on the design's behavior. You would be able to evaluate more design options, faster and at a lower overall cost.

To help make "getting it right the first time" more than just a slogan, you need a tool that will help you investigate the function of your design at the same time you evaluate form and fit. This tool needs to be useable not by specialists, but by the same person using Solid Edge to define the design. Dynamic Designer Motion is that tool.



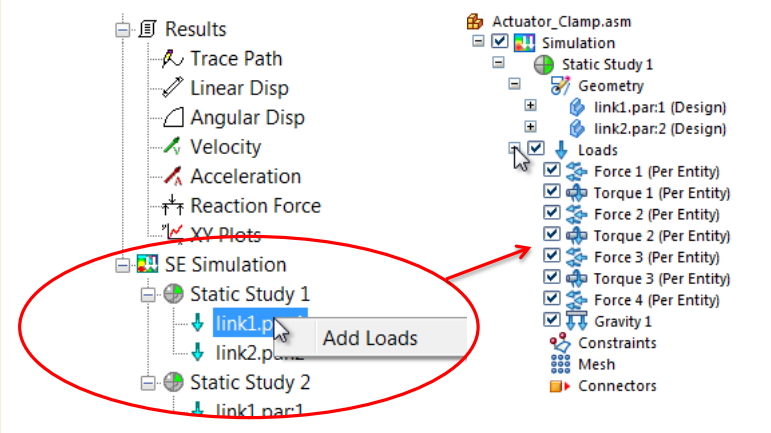


A Prerequisite for FEA

Moving parts and assemblies pose a unique challenge when determining the dynamic loads that should be applied to FEA models. Many times prototypes have to be built, instrumented and operated to determine loading conditions. Dynamic Designer Motion solves this problem by calcuating accurate dynamic loads as the design moves through its entire range of motion.

Integrated with Solid Edge Simulation

Not only does Dynamic Designer Motion calculate accurate dynamic loads, if you are using Solid Edge Simulation, the loads can be automatically transferred to a Solid Edge Simulation Study. This allows you to quickly calculate the stresses that result from the dynamic loads without having to worry about specifying load values and locations. Dynamic Designer Motion takes care of all of those things for you.



One click load transfer from Dynamic Designer Motion to Solid Edge Simulation

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Motion Simulation in Solid Edge

The Process

The process for performing a motion simulation inside Solid Edge involves four basic steps:

- Creating the Motion Model
- Adding/Controlling Motion
- Running the Simulation
- Reviewing Results

Creating a Motion Model

Once your Solid Edge assembly is complete, you designate which Solid Edge parts and subassemblies are included in the motion model, using a convenient drag and drop interface, or let Dynamic Desiger do it automatically. Mechanical joints are automatically created by converting your existing assembly constraints using Dynamic Designer's Automatic Constraint Mapping technology.

Adding and Controlling Motion

Mechanisms can be controlled in many ways. To make your simulation closely reflect real word functionality, Dynamic Designer allows you to add various motion characteristics to your model. Dynamic Designer supports motors, actuators, gravity, realistic contact between bodies, springs, friction, damping and other generated forces as needed.

Simulation

Running a simulation is as simple as specifying how long you want the simulation to run and then clicking the calculator icon to compute your motion results.

Results

Dynamic Designer calculates several types of results that you can use to verify the operation of your design. Moving interference animations, AVI and VRML files give you the visual feedback you need to understand if your design will work properly. However, what truly sets Dynamic Designer apart from a general animation package is the ability to provide engineering data associated with the movement of the assembly. Result vectors and plots of displacement, velocity, acceleration and forces, give you the numerical information you need to fully understand the performance of your design. As you make design changes, you can compare the data to verify design improvement.

Associativity

Dynamic Designer Motion objects are associative to the Solid Edge objects that were used to create them. If the Solid Edge assembly model changes the motion model is automatically updated and the simulation just needs to be re-run to evaluate the results of the change on the performance of the design.

You can retain the results of previous simulations and compare them with the results of the current design configuration.

Industry Proven Reliability

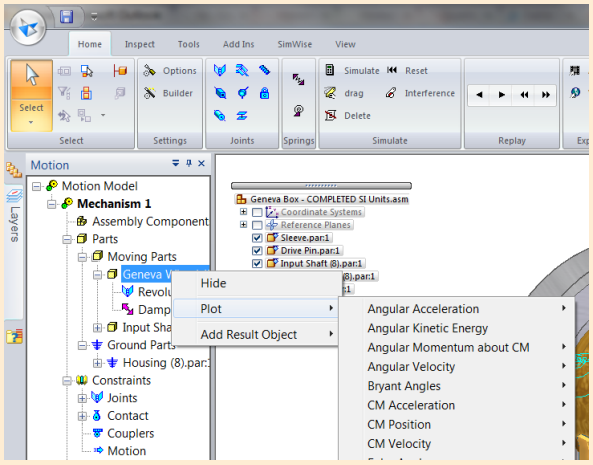
Dynamic Designer Motion is powered by the MSC.ADAMS™ solver, which provides you with reliable, accurate, and efficient dynamic motion calculations.

Intregration with MSC.ADAMS

Besides using the MSC.ADAMS solver Dynamic Designer Motion can also export the complete Motion Model, including geometry to MSC. ADAMS. There you can access the advanced capabilities offered by the ADAMS product line.

Embedded = Easy to Use

Tailored for the designer or design engineer, Dynamic Designer is completely embedded inside the Solid Edge environment. Being embedded means that start-up or "learning curve" time is very short because the need to learn a new product interface or spend time transferring design geometry to some outside environment is eliminated. By using Dynamic Designer, the process of verifying the function of your design becomes an extension of your existing product design process. You can quickly iterate through design variations without ever leaving the Solid Edge environment.



Why Motion Simulation?

If you design mechanical things with moving parts and assemblies, motion simulation can help you identify problems up front, during the design process when changes are cheap and easy to make, rather than later after tooling is built and products are in production. You can save time and money by eliminating some prototypes and testing, performing these tasks virtually, within Solid Edge, directly on your design model.

Dynamic Designer Motion allows you to answer the question "Does it work?" by virtually testing your design. Coupling the results of Dynamic Designer Motion with Solid Edge Simulation provides answers to the queston "Will it Break?"

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Dynamic Designer Motion for Solid Edge

Measurable Parameters

- Velocities, accelerations and displacements
- Reaction forces and torques
- Friction force, collisions
- Interference detection and closest distance between bodies

Motion Drivers

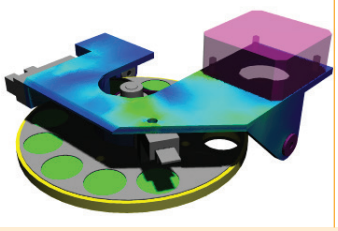
- Motors and actuators
- 6 DOF part motion

Contact Modelling

- Point to Curve
- Curve to Curve
- Full 3D

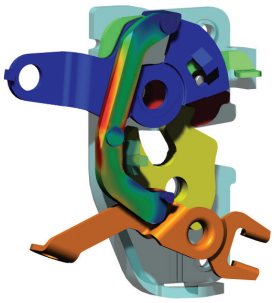
Constraints

- Automatically generated from Solid Edge assembly constraints
- Revolute, translational, spherical, universal, planar, rack and pinion, screw, fixed
- Inline, Inplane, Orientation, Parallel Axes, Perpendicular Joint primitives
- Friction can be applied at joints, joint primitives and contact
- Bushings



Forces

- Action Only Force and Moment
- Action/Reaction Force and Moment
- Linear and non-linear spring and damper
- Point to Point Impact force



Motion and Forcing Functions

- Constant
- Harmonic
- Step
- Data Points
- MSC.ADAMS functions

Simulation Types

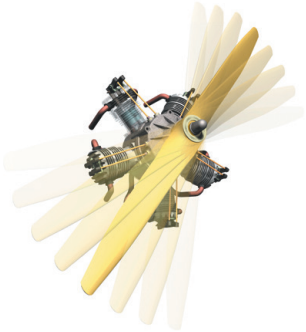
- Kinematic
- Dynamic
- Quasi-Static

Result Objects

- Linear displacment
- Angular displacement
- Velocity Vector
- Acceleration Vector
- Reaction Force/Moment Vector

Plotting

- Built in plotting
- Multiple axes and comparision plots
- Copy/Paste plot

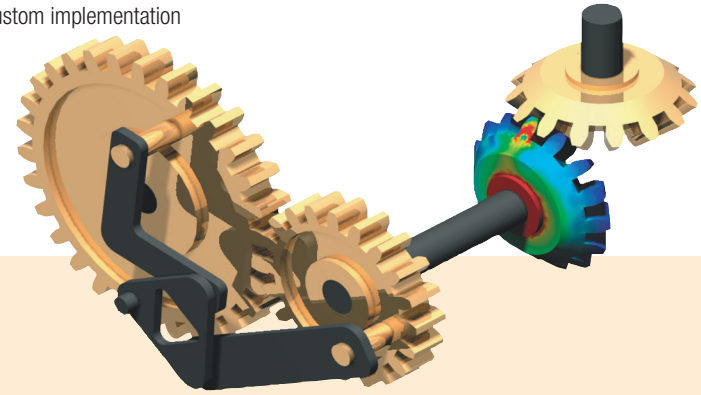


Interface to Other Systems

- Export results data and plots to Excel
- Export entire model to MSC.ADAMS
- API for custom implementation

Applications

- Size Motors and Actuators
- Determine how contact and collision effect the operation of a design
- Understand mechanism power consumption
- Determine bearing loads critical to accurate FEA
- Detect part interference throughout range of motion
- Simulate lock and latch operations
- Layout linkages and see how they work
- Visualize and investigate gear drive motion
- Create and simulate cam driven mechanisms
- Understand how friction effects operation
- Optimize springs and dampers in a mechanism
- Understand and reduce system vibrations



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Try it free!

Download an evaluation copy of Dynamic Designer Motion at:
www.design-simulation.com/DDM/ddmsedemo.php

Questions?

To learn more about Dynamic Designer Motion, please call us at:
1.800.766.6615 or 1.734.446.6935

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