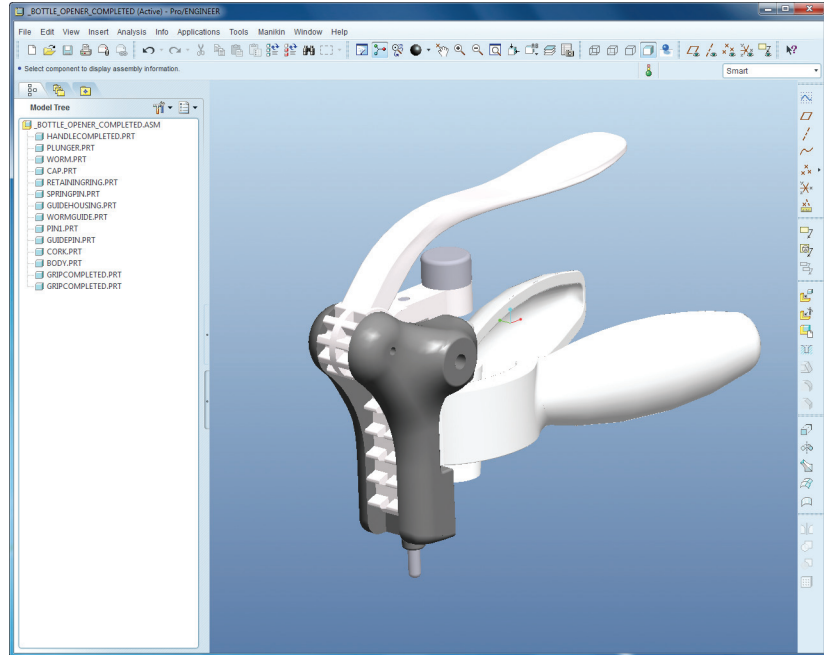


Autodesk Algor Simulation for Pro/ENGINEER: Deliver better products faster with Autodesk simulation software.

Every physical prototype you produce can cost thousands—or even millions—of dollars. Physical prototypes can cost even more in time, with building and testing of prototypes consuming valuable resources and slowing time to market. The market demands innovation and quality, so it's critical that you understand and improve product performance. Often, that could mean several rounds of physical prototypes. Yet the pressure to cut costs and accelerate product development cycles makes excessive reliance on physical prototypes impractical.



With simulation technology, you gain deeper insight into how a product will perform in the real world—before you build it. Simulation helps you understand the implications of design choices as you make them. From the earliest stages of the design process, it's easier to investigate product behavior, test innovative concepts, and optimize designs. You can even explore design alternatives, such as how different materials impact overall product weight, strength, and cost.

Autodesk provides a wide range of simulation capabilities with the Autodesk® solution for Digital Prototyping, helping you improve products, lower costs, and get innovative products to market faster. Autodesk simulation technology supports efficient workflows in today's multi-CAD environment by providing direct geometry exchange and full associativity with Pro/ENGINEER® and other CAD software tools—making it easy to integrate engineering simulation tools into your existing design process without requiring significant and costly changes.

Simulation provides a virtual testing environment that helps you to:

- 1 Validate** designs as you work. The effects of material choices and part interactions reveal themselves early in the design process, making it easier to improve designs and avoid costly mistakes.
- 2 Predict** how a product will perform in a variety of real-world scenarios. Run virtual performance tests that deliver comprehensive insight into how products will respond with ordinary and extreme use. Use this insight to help ensure the product will perform as needed and reduce the risk of failure.
- 3 Optimize** designs to lower production costs without compromising safety or performance. Prevent expensive over-engineering and reduce the use of raw materials.

Extend Your Simulation Capabilities with Autodesk Algor Simulation Software

Autodesk® Algor® Simulation products go beyond the capabilities of mainstream simulation by providing a comprehensive set of mechanical simulation tools that bring product performance knowledge into the early stages of the design cycle—helping you improve collaboration, design better and safer products, save time, and reduce manufacturing costs.

Autodesk Algor Simulation software integrates directly with Pro/ENGINEER software, making it easy to incorporate detailed performance insight into your current design process. Through easy-to-use tools, extensive CAD support, and proven technology, Autodesk Algor Simulation helps you accurately predict the real-world performance of products and further minimize reliance on physical prototypes—even for your most complex products.

Increase efficiency, reduce costs, and decrease the risk of errors with a deeper understanding of your designs by using a wide range of simulation tools, including:

- **Fatigue**—Perform complex fatigue analysis and predict fatigue-based failure. More easily design for durability and safety by subjecting a product to cyclic stresses and determining the product's expected design life.
- **Linear and nonlinear static stress and dynamics**—Study stress, strain, displacement, shear, and axial forces for a wide range of materials. As you enhance designs to reduce deformation and stress, make decisions that improve structural integrity while avoiding over- and under-engineering.
- **Mechanical event simulation (MES)**—Simulate complex, real-world situations using multibody dynamics along with support for large-scale motion, large deformation, and large strain with body-to-body contact. As you study motion and impact, explore options for improving overall product performance.
- **Computational fluid dynamics (CFD)**—Investigate thermal characteristics of designs and better understand the flow of fluids. Heat transfer simulation enables you to study changes in temperature. Fluid flow simulation helps you determine flow patterns, velocity, and pressure as well as the effect of fluids on your product.
- **Electrostatics**—Understand how voltage, current, and electric fields can affect product performance.
- **Multiphysics**—Study how multiple physical factors act simultaneously by combining results from multiple simulations to better predict a product's real-world performance.

Perform Accurate Simulations Efficiently

Simulation enables you to make critical engineering decisions earlier in the design process. Autodesk Algor Simulation provides tools to more easily study initial design intent and then accurately predict performance of a complete digital prototype.

When working with Pro/ENGINEER geometry, you can use automatic meshing tools to produce high-quality elements on the first pass—helping to ensure simulation accuracy within the areas of greatest engineering concern and predict product performance in less time. Use built-in modeling capabilities to directly edit the mesh—helping with the accurate placement of loads and constraints or to create simplified geometry for proof-of-concept studies. In addition, quickly validate design concepts before resources are invested in significant design changes or new products.

Choose the Right Materials

Support for a wide range of linear and nonlinear materials allows for better understanding of the real-world behavior of products. Whatever materials are included in a design, from metal to rubber, material data is vital to the accuracy of an engineering simulation—enabling you to learn more about how a product will perform and how it might fail.

Expand the Engineering Simulation Toolkit Easily

Decisions to further integrate engineering simulation into the design process can lead to unexpected costs and delays to retrain the product design team. By providing a range of validation, prediction, and optimization tools within the same easy-to-use interface, Autodesk Algor Simulation lets you start with mainstream tools and then expand your toolkit to include advanced simulation such as MES and CFD—without the need to learn new workflows.

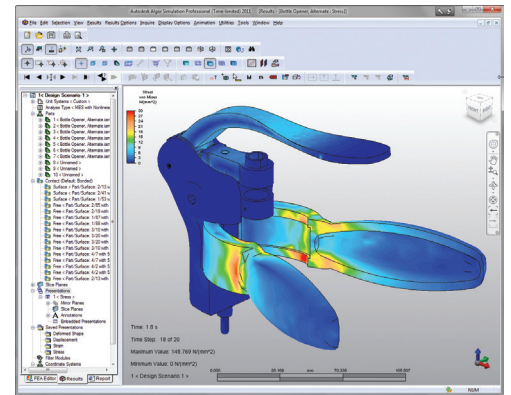
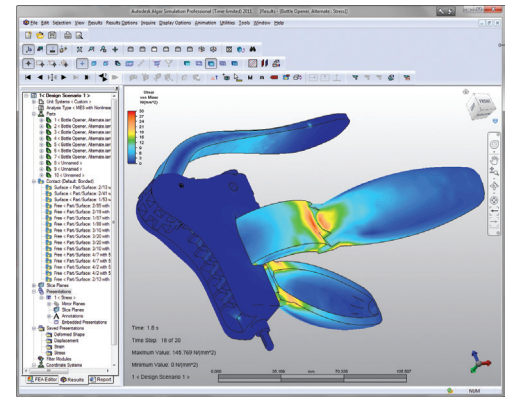
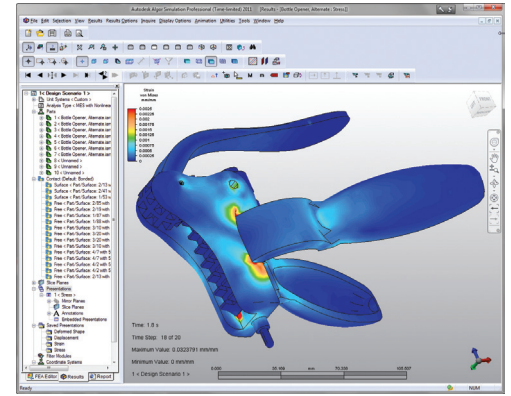
Combine Multiple Physical Effects in Advanced Simulations

Real-world product behavior is often the result of multiple physical effects interacting simultaneously. Advanced simulation setup is made easier through the use of standard engineering terminology, visual process guidance, and tools and wizards that automate the transfer of results between multiple simulations—letting you focus on product performance.

Simulate More and Build Fewer Physical Prototypes

Necessary design changes become more apparent when a product's real-world environment is fully simulated, but computationally intensive simulations take time and resources. Fast solvers in Autodesk Algor Simulation use the power of all available computing resources to perform parallel and distributed processing, allowing you to study more-realistic digital prototypes in less time.

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