

Design Engineer Tools in Pro/ENGINEER®

Advanced CAD Tools for Creating Superior Product Designs –Faster

Design engineers are faced with a host of ‘peripheral’ tasks beyond the design role that are getting more complex and more time-consuming by the day. In addition, the pressures of shorter design cycles and getting products to market first are higher than ever. How do you eliminate these pressures? First, examine the source of the time-consuming tasks in your process.

Endless Engineering Changes

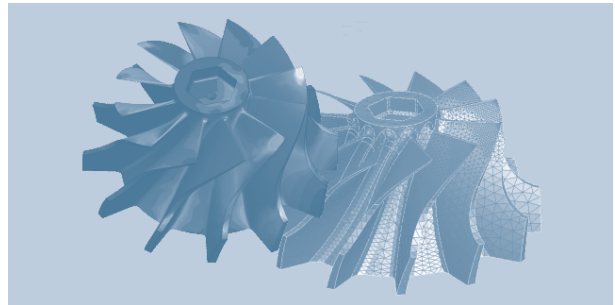
The path from design to manufacturing isn’t smooth or direct: it suffers constant dead-ends and reversals. Your design comes back to you with requests for changes to different parts of your product: the wiring harness, the framework, or some other custom-fabricated component. And while some changes are straightforward, others can have a domino effect that affect the structural integrity of the design and jeopardize your entire schedule.

Increasingly Complex Tasks

The needs of design engineers vary greatly, covering many diverse areas such as design optimization, functional simulation, large assembly management, advanced surfacing, and mechanical/electrical systems. However, you are often forced to use disparate applications from different vendors to solve these complex design issues, which means you not only have to learn a new program, but you also must struggle with importing and exporting your designs to and from these specialized applications. Data incompatibility between such standalone solutions remains one of the greatest challenges of the manufacturing industry today. Better CAD tools can eliminate these issues.

Dealing with Change and Complexity

In order to tackle these product development challenges, a more robust set of product development tools is required. Firstly, choose a design platform that covers the tasks that are specific to your company design processes. A 3D MCAD platform must not only cover the fundamentals—part modeling, assembly creation, drawings—but you must also assess whether or not you require specialist applications for advanced design activities such as top-down design for large assemblies, freeform surface modeling for aesthetic designs, and so on. Often, these advanced tasks are done in a different application with no associativity to the design CAD data so design changes and data compatibility can cause major headaches.



Eliminate prototypes by analyzing and optimizing designs digitally.

Secondly, it is not enough to be able to design your products, but increasingly, understanding the performance of your designs through Finite Element Analysis (FEA) will help to reduce the number of changes that cause delays. However, data incompatibility problems between the CAD and FEA tools often mean that design engineers have to perform unnecessary work to “de-feature” or simplify CAD models. This also means the simplified model analysis results lack the required level of accuracy. How can you effectively bridge the interoperability gap?

Choosing Pro/ENGINEER as Your Design Platform

Widely recognized as the industry’s fastest and most complete toolset, with over 310,000 commercial users, Pro/ENGINEER is the most popular 3D CAD solution in the world today. Additionally, Pro/ENGINEER uniquely provides for the needs of both small and medium businesses, as well as larger companies. As an affordable product design platform, the Pro/ENGINEER Foundation Advantage Package provides the perfect foundation for your company.

Pro/ENGINEER Foundation Advantage offers:

- Performance advantages ranging from 30% to 70% over ordinary 3D CAD products
- Intuitive, easy to use graphical user interface
- Fully associative capabilities spanning modeling, assemblies, drawings, animations, quality-checking, data exchange, & more
- Industry leading large assembly performance
- Compatible with 2D and 3D CAD tools and data
- Web connectivity for access to essential design information
- Powerful simulation capabilities for mechanisms design
- Scalable platform that’s fast, inexpensive, and easy to grade

Design Faster

Data translation and endless design changes can be reduced or eliminated with Pro/ENGINEER as your design platform.

Minimal Data Translation – Fewer Changes

Using Pro/ENGINEER Foundation Advantage Package as the foundation of your product development platform, data compatibility issues are reduced significantly. As you expand your design capabilities to meet your customers increasingly complex industry needs, Pro/ENGINEER has advanced tools built on an integrated architecture, so that data translation between these applications is eliminated. Additionally, Pro/ENGINEER makes it easy to reuse your other 2D and 3D CAD data, so you don't have to recreate it. You can automate the conversion of a 2D drawing into a smart 3D model. For 3D data import, surface cleanup is automated, so you don't have to be an experienced user to achieve excellent results.

Advanced Integrated Applications

No matter what your specialty is, be it sheetmetal design, routing pipes or cables, or developing structural frameworks, there is a Pro/ENGINEER solution especially suited to you. Every solution takes advantage of Pro/ENGINEER's robust associativity that makes it so easy to implement design changes and ensures all your downstream deliverables are always up-to-date.

Design Better

Understanding the performance of your designs through Finite Element Analysis (FEA) will help to reduce the number of changes that cause many delays.

Understand the Impact of Design Changes Immediately

Design changes are inevitable and changes such as adding a hole or moving a rib can affect the structural integrity of the part. With Pro/ENGINEER Structural and Thermal Simulation, you can easily analyze how the design change will impact performance. Uniquely, as you iterate your design, you do not need to switch between a different CAD solution and analytical software—you can do everything within one application.

Reduce Costs and Innovate More with Virtual Prototyping

Traditionally, the design cycle needs to allow ample time for the building, testing, and analyzing of physical prototypes. Not only are physical prototypes time consuming and expensive, but physical testing must be done late in the design cycle. Performance issues uncovered late in the design process mean very costly changes and more pressure on you to manage the change. With Pro/ENGINEER Structural and Thermal Simulation, you can digitally analyze the design to identify problems earlier when it is easier and cheaper to make changes. It also allows you to evaluate more design iterations which can lead to more innovative products.

No Specialized FEA Knowledge Required

Traditional FEA applications are very difficult to use and require the user to be an analysis expert with a solid understanding of FEA theory. The ease and intuitiveness of Pro/ENGINEER Structural and Thermal

Simulation means the majority of design engineers need only be good engineers—and not experts at analysis—to capitalize on the capabilities of design simulation

Self-Optimized Designs

With a unique capability known as Behavioral Modeling, Pro/ENGINEER allows you to set design rules and boundaries in the CAD model and will automatically resolve these different design requirements to arrive at the best solution. Based on your design requirements, Pro/ENGINEER will perform multi-objective design studies, automatically examining how various designs perform against the design objectives. Alternatively, you can use data from Microsoft Excel to drive your design. With Pro/ENGINEER, you can have confidence knowing your design will be optimized.

Additional Pro/ENGINEER Tools for Design Engineers:

Pro/ENGINEER Advanced Assembly Extension (AAX):

Design large complex products with powerful tools that support any top-down design process

Pro/ENGINEER Mechanism Dynamics Option (MDO):

Virtually engineer and simulate a product's dynamic mechanisms—early in the design phase

Pro/ENGINEER Routed Systems Designer (RSD):

Create complex, interconnected routed system diagrams with speed and accuracy

Pro/ENGINEER Expert Framework Extension (EFX):

Create top-quality structural frameworks 75% faster than ordinary CAD tools

Bring Higher Quality Products to Life Quickly.

From part modeling, assembly creation, framework design, static /dynamic analysis, and routed systems design, Pro/ENGINEER has all the capabilities you need for superior product design.

To learn more about these and other Pro/ENGINEER tools, visit www.ptc.com.

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