

PTC Creo® Elements/Direct® Design Productivity Package

Comprehensive 3D CAD Design Solution to Optimize your Product Development Processes

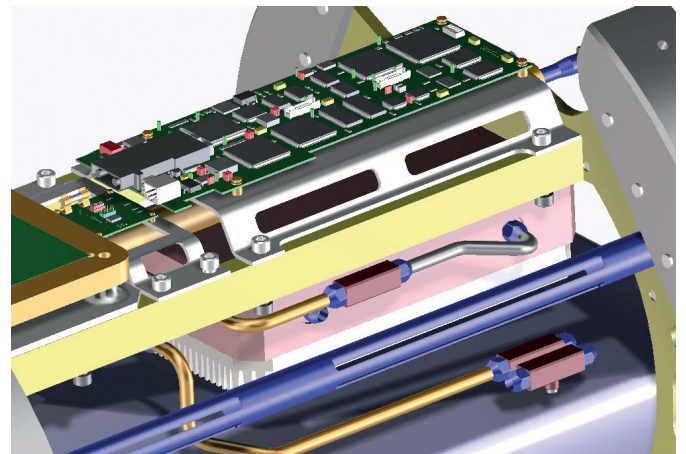
The PTC Creo Elements/Direct Design Productivity Package is a complete set of flexible design, validation, and simulation capabilities that greatly extends the 3D CAD power of PTC Creo Elements/Direct Modeling. With this powerful package, you get even more capability and performance from PTC Creo Elements/Direct Modeling, the world's #1 direct 3D CAD system.

With the PTC Creo Elements/Direct Design Productivity package, you get a set of seven essential design tools – for model design, cable design, sheet metal, FEA, advanced surfacing, and more – so you can improve your product development processes and drive new 3D CAD design. With this integral design toolset, you can build robust products faster, eliminate physical prototypes, streamline partner collaboration, reduce the frequency and lead times of ECOs, and minimize costs.

Drive Major New Product Development Initiatives

- Reduce both the number and the impact of engineering change orders (ECOs)
- Build virtual prototypes that include 3D parts, assemblies, sheet metal components, standard or supplier parts, and cable harnessing
- Decrease time-to-market by building robust, highly appealing products faster
- Eliminate physical prototypes by simulating real-world operating conditions on the desktop
- Increase engineering productivity by streamlining collaboration with design and manufacturing partners
- Minimize component and tooling costs
- Complete your 3D designs in a single, integrated environment

- Build 3D digital prototypes and then easily simulate and validate design iterations



Build prototypes including 3D parts, assemblies, sheet metal components, standard or supplier parts, and cable harnessing.

Key Benefits

- Reduce the frequency and time spent on ECOs that are the direct result of error-related rework
- Increase the quality and refinement of new and revised product designs by incorporating simulation and design validation into your development process
- Perform digital prototyping and eliminate the cost of extra physical prototypes while speeding development

- Find failure-prone areas within a product and resolve issues early, thereby boosting design quality and saving costs and time
- Achieve faster realization of optimal designs and avoid both failure-prone and over-engineered components

Drive New, Major Initiatives

Reduce ECO frequency and lead times

Create digital prototypes so you can not only visualize, validate, and analyze product designs under real-world conditions, but also reduce errors in manufacturing and save time by building fewer physical prototypes.

Build robust, appealing products, fast

Create complex industrial equipment quickly and easily by incorporating manufacturing processes, thus ensuring design for manufacturability (DFM). Avoid re-creating models, by reusing standard, off-the-shelf parts and components to accurately create the bill-of-materials (BOM).

Eliminate physical prototypes: Simulate real-world conditions on the desktop

Simulate real-world operating conditions without building prototypes. Use a variety of PTC Creo Elements/Direct modules to:

- Identify and reduce errors typical in moving mechanisms
- Simulate the complicated physical behaviors and material deformations of sheet metal components
- Detect undercuts and thin walls
- Ensure surface smoothness in plastic parts
- Validate cable connector positions and cable lengths

Use finite element analysis (FEA) to evaluate structural, buckling, and thermal conditions anytime during product design.

Streamline collaboration with design and manufacturing partners

Promote the use of preferred, off-the-shelf mechanical components, manufacturing materials, and processes. Tailor libraries to match those parts that are preferred and available to you and your partners. Leverage and reuse existing parts, assembly designs, and common library components to speed product development.

Minimize component and tooling costs

Generate sheet metal drawings of precise flat patterns containing the exact dimensions, tooling, and process information needed to manufacture the parts. For plastics, use your 3D design directly to create parting surfaces and to produce accurate core and cavity mold blocks.

A single, integrated environment for the entire design

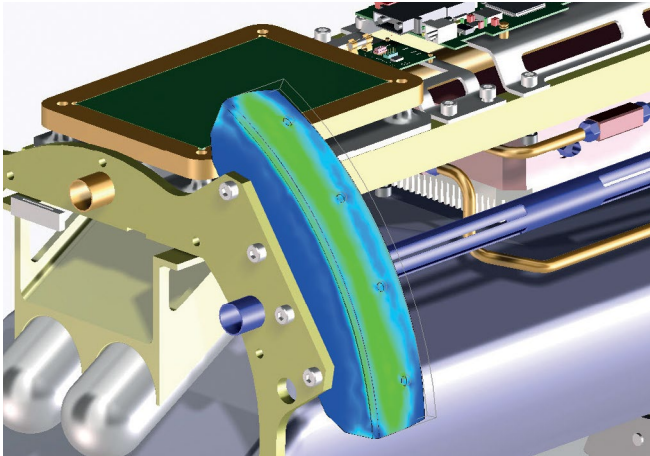
Design and validate parts and assemblies, moving mechanisms, wire harnesses, and BOMs –all in 3D – using the same environment you use for mechanical design.

Capabilities and Specifications

The PTC Creo Elements/Direct Design Productivity Package includes the following modules:

- **PTC Creo Elements/Direct Modeling:** A direct 3D CAD system providing you with a fast, lightweight, and flexible approach to 3D design
- **PTC Creo Elements/Direct Advanced Design:** Helps you simulate realistic motion, simplify design geometry, create parametric design variations, define inspection plans, and use dedicated design capabilities for plastic parts
- **PTC Creo Elements/Direct Sheet Metal:** A precision sheet metal module. Eliminates surprises in manufacturing by embedding sheet metal knowledge when designing parts with pre-defined bends, corner reliefs, and stamp and punch tools

- **PTC Creo Elements/Direct Cabling:** Combines electrical and mechanical design data, so you can fully simulate electromechanical products and shorten lead times
- **PTC Creo Elements/Direct Finite Element Analysis (FEA):** Enables you to perform a variety of FEA studies for structural, buckling, thermal, and frequency analysis, using various working load and boundary conditions that you apply to your product design



Simulate and analyze designs under stress and thermal conditions with PTC Creo Elements/Direct FEA.

- **PTC Creo Elements/Direct Surfacing:** Helps you add more style and easily create complex designs
- **PTC Creo Elements/Direct Part Library:** Makes it easy to use preferred parts and supplier parts during design to reduce costs and shorten lead times

PTC Creo Elements/Direct Modeling:

- Naturally create and interact with 3D geometry using familiar behaviors such as cut, copy, and paste and drag-and-drop techniques
- Create and modify 3D designs faster through direct, on-the-fly interactions with model geometry, enabling you to reach a given design solution as quickly as possible
- Effectively communicate your designs with 3D-to-2D associative drawings including shaded and rendered views

PTC Creo Elements/Direct Advanced Design:

- Add assembly relationships and constraints for physical simulation of mechanisms and detecting clashes in moving assemblies

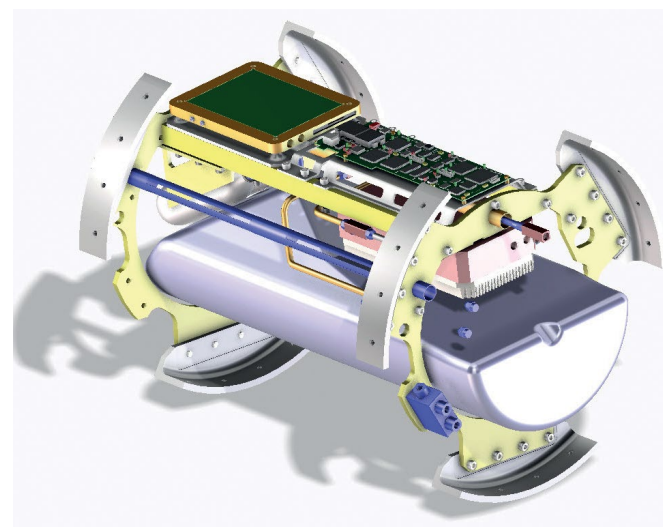
- Add parametric relationships and constraints for design variants and downstream modifications
- Streamline the design of plastic parts using plasticspecific capabilities, such as creating core and cavities, and leveraging predefined rib features
- Protect your Intellectual Property by simplifying part geometry and large assembly designs with a broad set of simplification rules and methods including:
 - Advanced concepts to set up merge, replacement, and visibility analysis instructions using dedicated simplification containers.
 - An outer faces collection mechanism.
 - Special pocket removal methods for larger, complex pockets and more.

PTC Creo Elements/Direct Sheet Metal:

- Design ready-to-manufacture sheet metal parts in 3D and in the flat
- Embed sheet metal knowledge and preferred materials while leveraging predefined punch and stamp tools
- Generate associative 2D flat patterns for manufacturing drawings

PTC Creo Elements/Direct Cabling:

- Design and route both cables and harnesses
- Create cable harness drawings for manufacturing
- Verify electromechanical designs



Build complete virtual 3D prototypes and then easily simulate and validate any ECO.

PTC Creo Elements/Direct Finite Element Analysis:

- Analyze stress levels, displacements, resonant frequencies, and thermal behavior
- Assign loads and boundary conditions directly to parts or assemblies
- Enable automatic mesh generation with mesh refinement and condition capabilities

PTC Creo Elements/Direct Surfacing:

- Create and modify complex surfaces
- Create solid models from a set of surfaces
- Analyze and visualize the curvature of surfaces

PTC Creo Elements/Direct Part Library:

- Take advantage of DIN, ISO, ANSI, and JIS standards with more than 170,000 parts: Screws, nuts, washers, rings, bolts, section steel, bearings, and more

- Improve efficiency with the fixture connection wizard

Language Support

- English, French, German, Italian, Japanese, Spanish, and Simplified Chinese
- The Partlibrary module is only available in English, German and Simplified Chinese

Platform Support and System Requirements

Visit the PTC [support page](#) for the most up-to-date platform support and system requirements.

For more information, visit:

<https://www.ptc.com/en/products/creo/elements-direct>

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