

Industrial Design Tools in Pro/ENGINEER

Create stunning products fast with advanced styling and surfacing

As an industrial designer, you have your work cut out for you. To meet the demand for highly stylish products, you need the freedom to brainstorm and iterate design concepts quickly, and instantly see how each change affects the overall product design.

Unfortunately, traditional CAD environments hinder this creative process. 3D model creation can be tedious and rigid, so by the time you complete a new design you've lost your original intent altogether. Often, your idea is too complex for your CAD or Industrial Design tools, so you settle for a less-than-optimal design, or worse, you scrap the concept entirely.

With today's advanced styling and surfacing tools, you don't have to compromise—or abandon—your brightest ideas. And since these tools are easy and intuitive, you can spend your time optimizing designs, not learning software. See how today's advanced styling and surfacing tools are helping industrial designers turn good ideas into great new products.

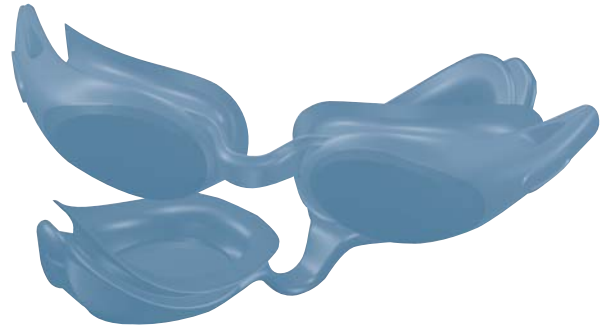
Looks Do Matter

In today's highly competitive market, companies need a distinct advantage to win. And aesthetics now play a big part in gaining that advantage. A great looking product not only inspires customers, it sets your product apart from the competition.

Studies confirm that appearance has a very positive impact on a product's sales performance. Consequently, industrial design is now viewed as a competitive weapon, with industrial designers as the key to achieving a great design.

Automobiles are a perfect example of the importance of aesthetics in the success of a product. Industry consultants estimate that about 20% of middle-aged car buyers are less interested in performance or reliability than in 'stylish fun.' On the margin, 'look and feel' are more likely to determine value. This trend extends well beyond the automotive industry to other markets. For instance, makers of home electronics such as cell phones, camcorders, and CD players can no longer rely solely on cutting edge technology to win consumer loyalty. Aesthetics also explain why the iMac® from Apple® Computer has been so successful: people simply like its looks. And despite all the technology built into a Nike® running shoe, its styling is often the determining factor in persuading the consumer to try it and buy it.

¹Virginia Postrel, "The Marginal Appeal of Aesthetics – Why Buy What You Don't Need," Innovation Spring, 2004



Using Pro/ENGINEER styling tools, QFD Consultants, a design consulting firm, creates stylish and complex surfaces with ease.

Opposing Design Needs Create Inefficiency

Most product designs consist of internal-engineered components surrounded by a sleek, eye-catching 'skin'. And whereas the internal components are modeled in a very precise, dimensionally based environment, the outer skin calls for design flexibility. Because these two facets of the product are conflicting, the internal and external parts are often created with two separate design tools. Consequently, designers are often faced with the tedious process of exporting the surfaces from one application to another. That means, with each design change to the engineered components, the surfaces must be recreated and re-imported, wasting significant time and effort.

With so much riding on the aesthetic appeal of a product, it is very important that industrial designers have access to 3D CAD solutions that maximize their creativity.

Role: INDUSTRIAL DESIGNER

	Detailed CAD (Design)	CAE (Refine)	CAM (Build)
FUNCTIONAL AREAS	Styling & Surfacing	Specialty	Verification
	Electrical Systems	Optimization	Machining
	Mechanical Systems	Structure, Thermal, Motion	Tooling
Design Foundation			

Core foundation package shown with role-specific functional areas.

“The flexibility in Pro/ENGINEER is incredible,” says Peter Newbury of QFD Consultants, a design consulting firm for product development. “Prior to using [Pro/ENGINEER Interactive Surface Design], more than three-quarters of our modeling time was feature planning. With [ISDX], feature planning is dramatically reduced to about one tenth of the modeling time. Drastic changes that used to take hours can now be done in as little as 15 minutes, and the surface quality is far better.”

Bring Your Ideas to Life – Fast

PTC offers a unique solution for Industrial Designers that bridges these internal/external design tasks. With the advanced styling and surfacing capabilities of Pro/ENGINEER® Wildfire™, industrial designers now have the best of both worlds.

Pro/ENGINEER Interactive Surface Design Extension (ISDX) offers all the power of quick and easy complex surface creation within the parametric modeling environment of Pro/ENGINEER Wildfire. Because all these capabilities are contained within a single, easy-to-use solution, there’s no importing and exporting surfaces. This saves an enormous amount of time and frees designers to focus on adding value to the design, not on transferring and interpreting data.

In addition, by combining these capabilities into a single solution, designers and engineers can collaborate with ease. Instead of working in a sequential process of creating first the internal-engineered components and then the surfaces, ISDX offers a unique, parallel-modeling environment where designers and engineers work together, designing in the same application. Here, free-form geometry can easily be manipulated. And with real-time visual dynamic feedback, it’s extremely easy to ‘flex’ the model and immediately see how changes affect the design. Curves and surfaces can have as many or as few constraints as desired. So you achieve the optimal design very quickly.

Complete Cache of Power CAD Tools

Not only does PTC provide solutions to facilitate modeling, the company’s Pro/ENGINEER toolset includes additional modules to assist with the initial phases of design as well. Capabilities such as freeform surfacing, reverse engineering, and photo-realistic rendering enable engineers to capture ideas digitally and refine them. Engineers can easily transfer models across departments through diverse media types and send them directly to rapid prototyping machines. What’s more, Pro/ENGINEER offers 100% associativity, which means that any change to a model part or assembly automatically updates everywhere.

- With Pro/CONCEPT™, initial designs are conceptualized with easy 2D and 3D sketching and modeling tools. From Pro/CONCEPT, SLA export allows prototypes to be directly developed. Or, for more precision, models can be further refined with Pro/ENGINEER.
- The Reverse Engineering Extension allows engineers to transform existing physical products into digital models, saving significant time and effort. Scanned data is used to accurately transform a physical prototype into flexible surfaces that are easily modified.

- The Advanced Rendering Extension lets you create stunning photorealistic images of models before creating costly physical prototypes. Photorendering also saves money by enabling you to explore a design’s aesthetic appeal early in development when it’s still inexpensive to make changes and incorporate feedback.

Styling and Surfacing Tools for Industrial Designers:

From ideation, to interactive surface design, to product presentation and reverse engineering, the Pro/ENGINEER suite of styling and surfacing tools offers all the essential capabilities for superior conceptual and industrial design.

Pro/CONCEPT

Explore dramatic product ideas rapidly

- Replace physical prototypes with virtual prototypes
- Work with simple tools for mixed-set sketching, curve layout and modeling
- Create and retouch sketches, images, photographs

Interactive Surface Design Extension

Fast, flexible surface modeling

- Import 2D images and 3D geometry for use as modeling references
- Quickly create freeform curves and surfaces
- Fully control positional, tangency, and curvature conditions

Reverse Engineering Extension

Convert physical products into virtual models

- Create surfaces automatically with scanned data
- Work with flexible facet modeling tools
- Refine point clouds and quickly fill in gaps

Advanced Rendering Extension

Create photorealistic images

- High-end ray tracing
- High-performance rendering
- Advanced visual effects, such as realistic materials and depth of field

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