

NX for Industrial Design and Styling

A complete toolset for enabling industrial designers to differentiate their products through styling and innovation

Benefits

- Improves competitiveness by enabling you to implement significant design advantages to product development projects where style, aesthetic appearance or quality of form is a key market differentiator
- Enables designers to quickly refine their design concepts with powerful freeform shape modeling
- Reduces concept development time by supporting reverse engineering processes
- Increases productivity by enabling you to design what you want and how you want it without the constraints imposed by standalone, non-integrated design tools
- Enables you to maintain cross-discipline design intent by eliminating the traditional disconnect between design/styling teams and the rest of your product development organizations
- Enables your industrial designers to consider styling, functionality, manufacturability and affordability issues throughout an evolving and highly iterative design process

Summary

The NX™ software toolset for industrial design and styling provides industrial designers with a complete environment they can use to create distinctive and innovative product designs that balance aesthetics and ergonomics with performance, quality, cost, material and manufacturability considerations. NX's powerful and flexible toolset enables your designers to select the most suitable design tool to explore shape and what-if styling during the concept and modeling phase.



NX's industrial design and styling tools have been used to develop some of today's most innovative designs.

NX's toolset for industrial design and styling enables industrial designers to develop product designs in a single environment that enables them to rapidly define the design concept and then seamlessly transition these concepts through a complete concept-to-market process that encompasses product engineering, simulation and manufacturing.

NX provides the following industrial design and styling tools.

- Concept design and styling, which gives industrial designers the freedom to develop a concept design by using the modeling approach they deem most appropriate and then perform surface continuity and analysis, advanced rendering and concept evaluation in a comprehensive NX digital product development environment that extends the industrial designer's traditional toolset.
- Reverse engineering, which enables industrial designers to build a CAD model from a design concept created in a physical medium and analyze it from multiple perspectives.

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Benefits *continued*

- Places traditional engineering tools in the hands of industrial designers and stylists while leveraging task-oriented workflow to maximize tool usability
- Reduces design cycle by enabling review teams to rapidly evaluate design concepts through the use of photorealistic images and virtual prototypes
- Maximizes re-usability by enabling designers to quickly develop concept models that yield high quality surfaces which are totally usable throughout the complete product development cycle

Features

- Comprehensive toolset for production surfacing and full design completion
- Design and styling tools for freeform shape modeling, surface continuity and analysis, advanced rendering and visualization
- Curve-based design tools for creating styled shapes via splines and sketching
- Surface-based design tools for creating and modifying slab surfaces
- Flexible shape editing and manipulation, including tools for curve and surface display, logo mapping, geometry shaping, dynamic feature creation/ manipulation, styled blend and styled corners
- Visualization and rendering tools for rapid concept evaluation, including tools for generating photorealistic images and virtual prototypes
- Reverse engineering tools for building a CAD model from a physical concept model

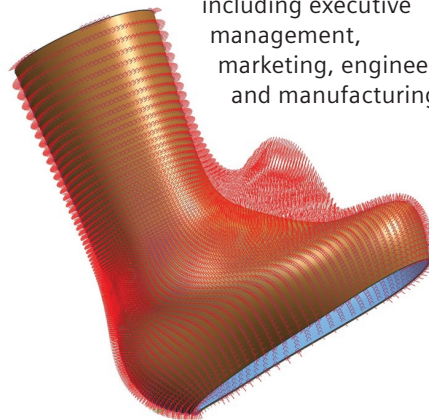
- Full design completion, which enables industrial designers to shorten the overall product development cycle by removing traditional barriers between styling and other disciplines and taking the concept design through the product engineering, simulation, manufacturing and tooling phases of your product lifecycle.

Today's industrial design challenges

Design is the key differentiator in many industries. Consumer packaged goods, medical devices, high tech electronics, perhaps food and beverage packaging, footwear, automobiles and many other products rely on industrial design and styling to make a significant difference as companies compete for increased market share.

Distinctive design and styling gives companies in these industries a significant competitive advantage. But in today's markets, form, fit and function are equally important since they are crucial factors that determine whether customers have a positive experience with a product each and every time they use it.

In order to deliver innovative designs that are functional, manufacturable and affordable, industrial designers must be able to satisfy the design criteria expressed by all of the major stakeholders in your product lifecycle, including executive management, marketing, engineering and manufacturing.



NX provides detailed surface analysis tools to help designers evaluate curvature and continuity.

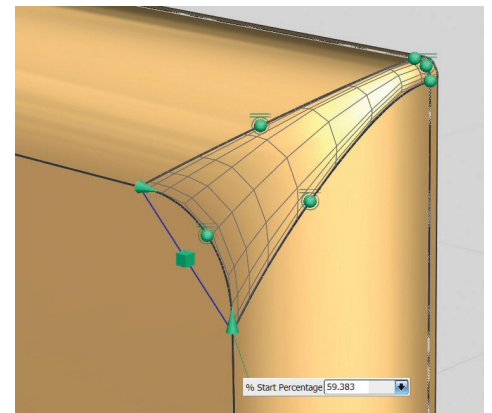
This imperative requires industrial designers to establish cooperative relationships with these stakeholders, many of whom participate downstream in

the product lifecycle. In addition, industrial design and styling needs to be performed as the first step in systematic and repeatable product development process that has to accommodate frequent change as new opportunities and new requirements arise.

NX's state-of-the-art industrial design and styling capabilities

NX is driven by the needs of industrial designers, whose innovation and creativity serve as the springboard for inspired new products. At the same time, NX synchronizes a design's form, fit and function considerations with the requirements of other disciplines involved in your concept-to-market process.

NX provides flexible, idea-sparking tools atop a practical architecture that maintains downstream data integrity through data associativity. NX enables industrial designers to explore shape and style while establishing a seamless transition into your company's engineering, simulation and manufacturing domains.



With NX, designers can easily and rapidly add styling details to product models.

NX delivers state-of-the-art design solutions that transform your entire product development cycle. NX represents a radical departure from conventional CAD systems. NX extends industrial design and styling with unique technologies and methodologies that improve process efficiency, by eliminating wasted work, including:

Features *continued*

- Tools for scanning physical objects and mapping surfaces or curves to a polygon mesh, as well as visualization and rendering tools for rapidly evaluating the polygon mesh
- Inspection tools for evaluating a physical model (e.g., mold or die) and updating the CAD model to reflect manufacturing process variations (deviation analysis)
- Configurable/customizable, roles-based designer interface that makes it easier for industrial designers to work with powerful NX engineering tools

Knowledge-enabled design NX automates and simplifies industrial design and styling by enabling you to leverage the product and process knowledge that your company has gained from its experiences, as well as from industry best practices. NX tools enable designers to capture knowledge in the form of high-level product structures, templates, frequently used design features, engineering rules, formulae and validation checks. Knowledge-enabled design helps your design teams make design and styling decisions quickly by providing them with detailed knowledge about product performance, as well as knowledge they can use to address potential manufacturability issues.

Process innovation and design productivity NX enables you to establish an interactive environment where everyday design work can be streamlined through the implementation of task-oriented workflows that improve designer productivity. NX's role-based interface provides your designers with an interface that grows as extra functionality is needed. Equally important, the NX interface is especially valuable for casual users who are not necessarily familiar with traditional digital engineering tools. NX dynamically integrates your design process with a full set of product engineering, simulation and manufacturing processes.

At a more specific level, NX addresses the industrial design and styling process directly through its capabilities for:

- Concept design and styling
- Reverse engineering
- Full design completion



NX rendering and visualization tools help designers to evaluate design aesthetics.

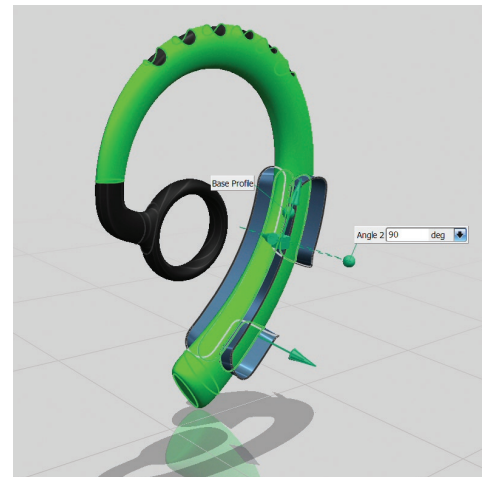
Concept design and styling

NX delivers a flexible and robust toolset for fast concept design and styling that includes powerful shape creation and refinement, advanced rendering and surface continuity and analysis capabilities – all of which combine to increase the productivity of your industrial designers and enable them to deliver superior designs.

NX provides the freedom and accuracy that designers need to explore shapes and what-if styling during the modeling phase. By seamlessly combining surface and solid modeling, as well as giving the designer access to traditional CAD engineering tools, NX provides a completely new kind of industrial design and styling solution.

Unlike traditional design systems, NX provides the industrial designer with multiple alternatives when performing today's complex designing tasks. For example, designers can begin their modeling by using standard parametric design techniques that employ curve-driven geometry. Then, to create contours and integrate ergonomics, designers can use freeform techniques. Alternatively, designers could begin their modeling without precise definitions and then add geometric constraints later.

Construction geometry and style details can be rapidly generated by dynamically mapping 3D curves onto freeform shapes.

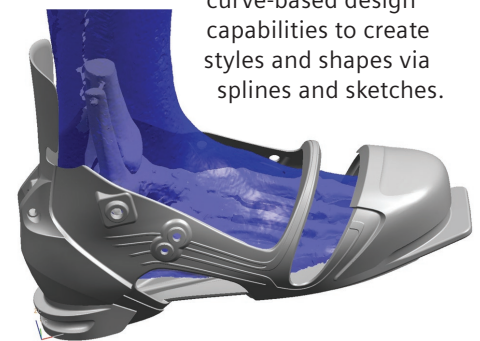


NX provides powerful modeling tools that streamline the creation of complex geometries.

Or surfaces can be constructed using preset combinations of section and guide curves – with designers monitoring impact as it occurs.

Freeform shape modeling NX provides all of the tools that industrial designers need to explore shape and style. NX has all of the flexibility and shape creation tools that standalone industrial design applications have – but with the integration required to leverage these tools in an environment that facilitates full design completion.

Designers can use NX's curve-based design capabilities to create styles and shapes via splines and sketches.



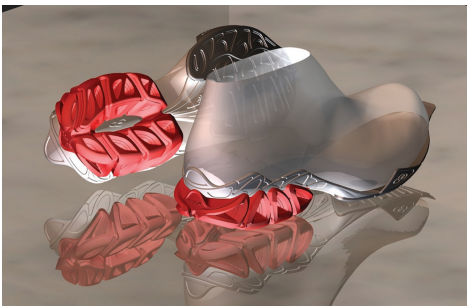
Designers can leverage NX's freeform shape modeling, scanned data and visualization tools to accelerate concept design and ideation.

Sophisticated NX modeling and visualization tools enable designers to quickly refine the design concept, including applying color, materials, textures and lighting. NX provides the freedom and control that designers need to evaluate and manipulate shapes in real time. NX facilitates geometry shaping, which lets you implement a manufacturing approach

to design, where designers create a flat design and then bend it to its final shape.

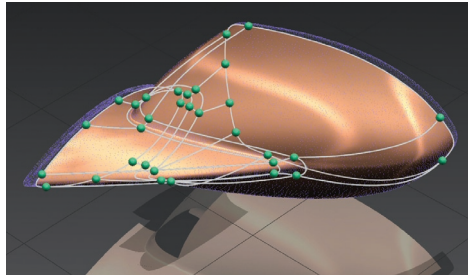
Surface continuity and analysis NX is far superior to other high-end surfacing tools. Designers can use NX to create many different surface types, including slabs, fillets, corners, transitions and washouts. NX enables designers to combine curve-based surfacing, pole editing and sweeping into one workflow so that they can choose the most efficient tool for the modeling task at hand.

NX lets designers control the flow and reflection of light across the entire design. Designers use NX tools to get real-time design feedback, including real-time highlights, real-time reflection lines, curvature combs, dynamic sectioning, real-time draft analysis and real-time reflection mapping. Just as importantly, NX's fast modeling techniques yields high quality surfaces that are totally re-usable throughout the complete product development process.



Advanced rendering and rapid concept evaluation NX real-time rendering provides industrial designers access to "real" materials within NX – enabling them to generate advanced photorealistic images that can be used to accelerate the

design review cycle. NX can also be leveraged to create virtual prototypes, which can be used for rapid concept evaluation and iterative design validation across your entire product lifecycle.



NX accelerates reverse engineering by facilitating rapid surfacing of scanned data.

Reverse engineering

NX supports a highly flexible approach to reverse engineering that enables industrial designers to reduce the time required to initially develop the design concept.

Physical model scanning NX tools enable designers to scan in physical objects (i.e., design concepts created in a physical medium such as clay or foam) and then generate a CAD model by mapping surfaces and curves to the polygon mesh.

Rapid concept evaluation NX visualization and rendering tools can be applied to the polygon mesh to rapidly evaluate the imported scan data.

CAD model analysis Designers can use NX tools to analyze the scanned model for stress/crush, mold-fill, manufacturability and virtual consumer testing.

Deviation analysis Designers can inspect physical models, such as a mold or die, to reflect manufacturing process variations and improve manufacturing quality.



Some of today's most exciting industrial designs were developed using NX's powerful design and styling tools.

Full design completion

With NX, your company can develop its products from concept through manufacturing through a complete toolset for full design completion. NX unites all of your take-to-market disciplines – marketing requirements, industrial design and styling, engineering, simulation, tooling and machining – within one unified digital product development environment.

The integrated NX solution set puts traditional engineering tools in the hands of your designers and stylists. NX reduces "throw away" designs and superfluous "what if" decision making. NX's complete toolset removes the traditional disconnect between styling and the rest of your product development disciplines.

Designers also can use NX to rapidly create virtual prototypes that interactively illustrate your design concepts, share these realistic concepts with other disciplines and inexpensively iterate these concepts in a fraction of the time it takes to change and review physical prototypes.

Contact
Siemens PLM Software
Americas 800 498 5351
Europe 44 (0) 1276 702000
Asia-Pacific 852 2230 3333

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