

Siemens PLM Software

## NX for Industrial Design

Power, flexibility and control for concept design and styling

### Benefits

- Capture and refine concepts faster
- Iterate and evolve designs easily and quickly
- Develop product forms in a fraction of the time required with traditional tools
- Distinguish products with style, aesthetic appearance and quality of form
- Reduce time-to-production with integrated product engineering
- Maintain design and styling intent from concept through production

### Summary

NX™ software delivers a powerful and comprehensive set of tools for industrial design. With advanced modeling, shape analysis, rendering and visualization tools, NX delivers all of the capabilities of dedicated industrial design systems, and also offers full integration of the design function with product engineering that helps you accelerate the product development process.

### Developing advanced forms in a fraction of the time

Merging the form, fit and function of products is increasingly important to innovation in virtually every industry. Companies are using advanced forms that unite function and ergonomics in aesthetically pleasing designs to distinguish their products, and conceptual design is critical to their

success. However, developing advanced 3D forms has traditionally been a complex task that requires specialized expertise of several design and engineering disciplines, and often a set of different software tools. NX industrial design capabilities significantly reduce the barriers to rapidly developing advanced 3D forms.

With NX Realize Shape™ modeling tools, designers can create highly stylized shapes and advanced forms in a fraction of the time required with traditional computer-aided design (CAD) tools. Using subdivision modeling technology, NX Realize shape delivers a fast, efficient and easy-to-use modeling approach that does not require specialized knowledge of curve and surface design techniques.

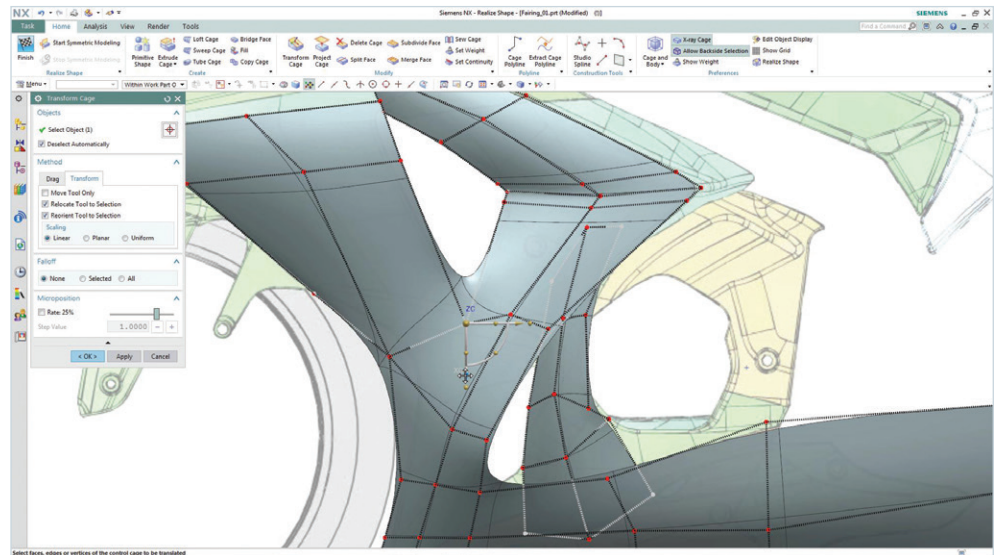
# NX for Industrial Design

## Benefits *continued*

- Reduce design time with reverse engineering capability
- Increase productivity with powerful and versatile design tools
- Rapidly evaluate design concepts with advanced visualization and virtual prototypes
- Collaborate across product disciplines
- Easy to incorporate feedback from end users, engineering and manufacturing
- Quick to impact design change

## Features

- Powerful, flexible, comprehensive toolkit for advanced shape design
- Integrated curve, surface, and solid modeling capabilities
- Advanced surface quality controls and validation tools
- Integrated subdivision modeling
- Intuitive, easy-to-use modeling
- High-performance visualization and rendering tools
- Reverse engineering tools for designing from physical concept models



*NX Realize Shape delivers fast, intuitive subdivision modeling technology for more efficient design of complex shapes.*

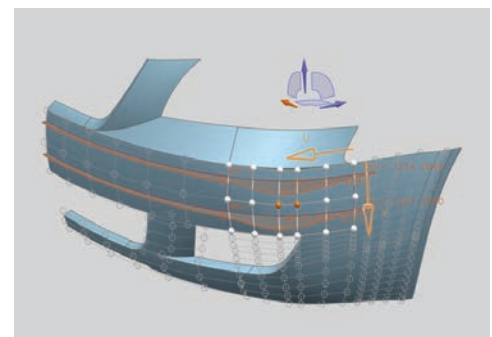
Using NX Realize Shape, designers can continuously manipulate shapes by subdividing an initial form to add greater levels of detail. By manipulating a control mesh with intuitive push-and-pull operations, designers can quickly deform, modify, drag, extrude and morph geometry to develop complex forms. The result is high-quality, precise models with curvature-continuous surfaces that are manufacturable.

NX Realize Shape supports fast capture and exploration of design concepts in a streamlined workflow that offers greater creative flexibility, speed and control to explore as many design alternatives as possible.

### **A compete toolkit for freeform design**

In addition to NX Realize Shape, NX offers an extensive set of freeform design tools that are useful in all product development disciplines and processes, from concept through manufacturing. These capabilities offer designers versatility and full control when developing advanced shapes using curve-, spline-, and surface-based design techniques. Mixed-mode modeling offers designers a high degree of flexibility to work with 2D and 3D, solids, surfaces and facets.

The freeform design tools include capabilities for creating solid models using loft, sweep and mesh techniques, surface trimming and extension, surface transitions and advanced filleting. More advanced functions extend the freeform toolset to include synchronous sculpting of surfaces and solids and unique history-based class A surfacing methods such as control point editing (X-Form) and surface matching. NX also helps create surfaces from faceted or external point cloud data, supporting reverse engineering workflows. When developing advanced surfaces, designers can maintain boundary continuities with controls ranging from G0 to G3 continuity.



### Shape analysis and validation

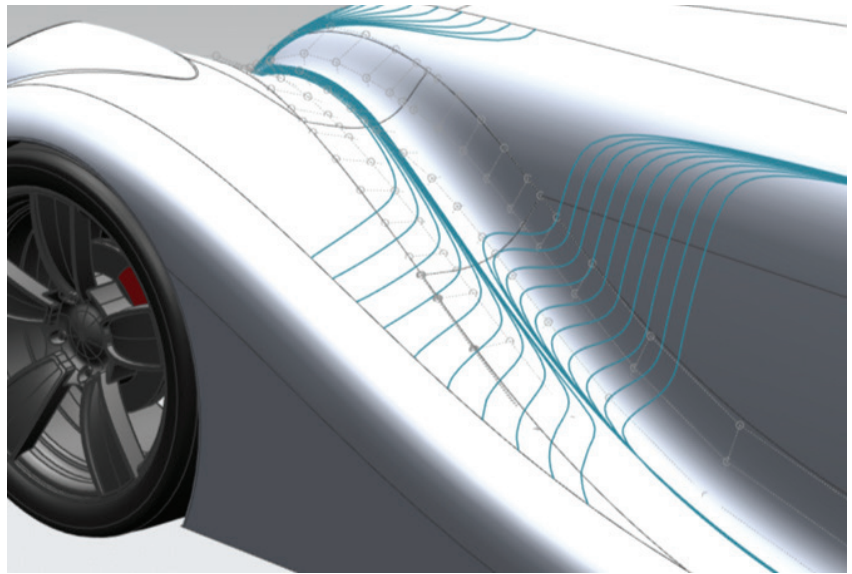
Designers can readily evaluate the analytical and visual quality of complex shapes with the real-time analysis functions of NX. Continuity and curvature checking analyze curves and surface connection quality and flow. Gap and flushness analysis measures the openings between surface panels and helps evaluate their appearance. Highlight lines and reflection contours help assess surface quality by generating reflected or projected lines from light sources, and isocline curves help analyze slope variations. The real-time graphical displays accelerate evaluation and help guide modifications to improve shape quality.

### Rendering and visualization

NX includes high-performance rendering and visualization tools that help designers explore materials, colors and textures, and visualize products in different scenes and environments. Designers can choose from a variety of real-time rendering modes to display their designs with materials, reflections, backgrounds, floors, shadows and lighting. Each rendering mode provides easy setup of a default scene with the push of a button. Real-time ray tracing produces photorealistic images with inter-object reflections, refractions and global illumination effects, and gives designers a comprehensive set of specialized visualization features.

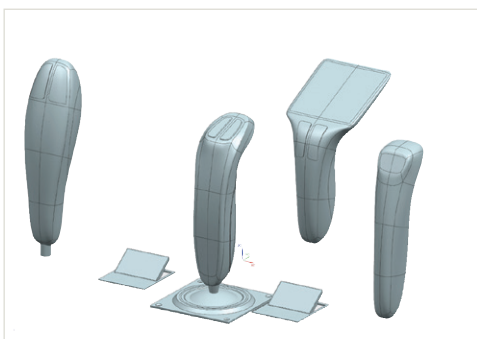
### Integrating design and engineering

Leading manufacturers understand the importance of integrating design and



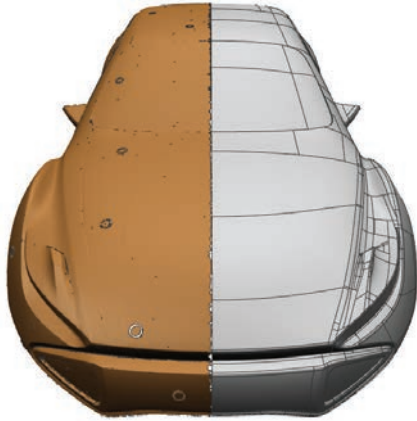
*NX analysis tools help ensure surface quality, continuity and aesthetics.*

engineering to accelerate product realization and reduce time to market. With separate solutions for design and engineering, initial design data must be recreated before engineering begins. NX seamlessly integrates design and engineering in a single system that significantly reduces the time and effort required to realize the final product from initial design concepts. Initial design data can be readily shared with the engineering team, and designers can incorporate engineering feedback earlier in the development process.



*Designed by Snø Design Studio, Norway - [www.snodesignstudio.com](http://www.snodesignstudio.com).*





*NX enables rapid surface creation from scanned data.*

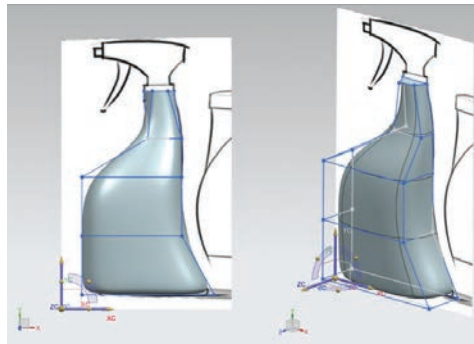
#### **Packaged solutions for industrial design**

NX industrial design capabilities are available in two prepackaged solutions and an add-on application.

**NX Cool Shape Design** is a prepackaged solution for early concept and industrial design, developed for industrial design departments of larger companies as well as design consulting and services companies. It includes the full suite of product design functionality, including NX Realize Shape subdivision modeling, freeform design, shape analysis, visualization and rendering, basic assembly modeling and data translation.

**NX Mach 3 Industrial Design** is a comprehensive solution for customers who perform all aspects of product design and development, from early concepts to detailed design and engineering in the context of an end-to-end design workflow. The package delivers all of the capabilities of NX Cool Shape Design, and also provides powerful and versatile design engineering capabilities, including advanced assembly design, drafting, validation tools and a range of design utilities.

**NX Shape Design** is an add-on package for the NX Mach 1 Design solution. It includes the advanced design functions of NX Realize Shape, freeform design and analysis, and visualization and rendering. Customers using NX Mach 1 can add NX Shape Design to expand from entry-level design capabilities to a high-performance shape design solution.



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