

NX Overview

Siemens PLM Software

www.siemens.com/plm



A complete solution for digital product development, NX® software delivers integrated, high performance design, simulation, documentation, tooling and manufacturing. With NX, companies can accelerate time-to-market, improve product quality, reduce costs, and leverage product and process knowledge to improve innovation.

NX

SIEMENS



**Siemens PLM Software
digital product development**

Delivering high-quality products quickly and inexpensively is a basic requirement in the global economy. The current business imperative is *innovation*.

Developing products with the innovative features that customers want is the only way to grow top-line revenues and sustain competitive leadership. Product innovations must be matched with innovations in development processes to ensure that your products get to market on time and at competitive cost.

To meet these challenges, companies are transforming their product development processes through strategic technology investments. The transformation requires new tools and approaches that surpass the productivity gains of mainstream CAD, CAM and CAE.

Digital product development goes beyond individual and departmental productivity, helping you establish a holistic approach to product development that stresses knowledge capture and re-use in a managed, collaborative environment. Visibility into information, programs and processes leads to greater flexibility, responsiveness and efficiency. Embedded real-time simulation enables you to design in performance and quality and drive product innovation.

Siemens PLM Software, a global division of the Siemens Automation and Drives (A&D), helps companies attain the business value of digital product development with NX.

Introducing NX

NX powers innovation by integrating all aspects of the design-through-manufacturing process in a high-performance digital product development solution. Built on an open, advanced technology foundation, NX delivers greater power to achieve superior productivity in all product development disciplines:

- **Industrial design and styling**
- **Design**
- **Simulation**
- **Documentation**
- **Tooling**
- **Machining**

From initial concept to finished product, NX supports your entire development team with the industry's broadest range of integrated applications, each providing best-in-class capability and workflow efficiency.

NX is much more than a suite of integrated CAD, CAM and CAE applications. With engineering process management powered by Teamcenter® software, NX is a product development solution that is greater than the sum of its parts. All product development applications are interconnected in a managed environment. Product data and engineering process management tools provide a single source of information that coordinates all phases of development, improves collaboration, and enables continuous improvement of your design, engineering, and manufacturing processes.

NX solutions target critical business initiatives

New product development

Improve product innovation by integrating development processes, re-using product and process knowledge, and by simulating and optimizing performance and manufacturability early in the development cycle.

Value chain synchronization

Synchronize design, engineering, and manufacturing information in workflow-driven processes to collaborate across a fully digital product development environment.

Enterprise data management

Connect work-in-progress data and released data. Integrate engineering bills of material with enterprise bills of material.

Commonization and re-use

Capture and re-use product and process knowledge. Leverage libraries of designs and company-specific information to streamline product development processes.

Knowledge/intellectual property management

Capture company know-how and best practices to automate development. Deploy expert knowledge for use by non-experts.

Regulatory compliance

Validate designs for compliance to safety, performance and customer requirements early in the lifecycle. Simulate disassembly and disposal for recycling.

Production efficiency

Improve design through manufacturing productivity with high-performance integrated solutions. Automate complex processes to improve quality and reduce waste.

Systems engineering and mechatronics

Optimize and integrate mechanical and electrical subsystems with process-specific tools. Propagate changes across subsystems with systems-level product control structures.



NX business value

In a business environment that demands quality products delivered on time at low cost, NX gives you advanced-capability tools and technologies that can help you gain and keep a competitive advantage.

Get to market faster. NX accelerates product development with proven high-performance automation that delivers greater productivity gains. All NX applications work from a unified product definition with built-in collaboration and engineering process management. The integrated solution ensures fast progress through all stages of product development.

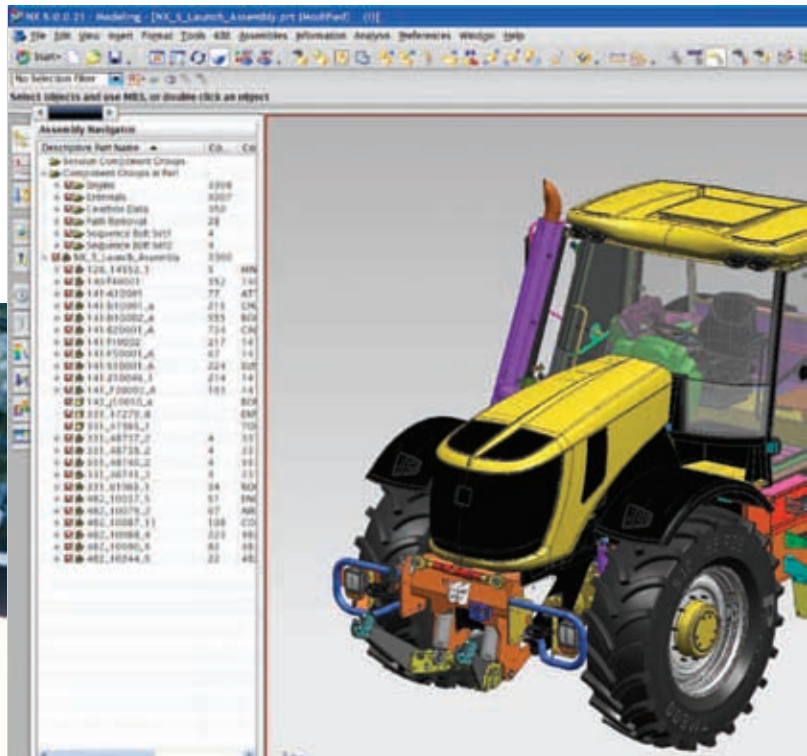
Improve productivity. NX multiplies productivity in product development with advanced technology, usability features, and re-use capabilities that deliver greater workflow efficiency. The high-performance CAD, CAM and CAE tools in NX help optimize all development processes with best-in-class capability. NX also helps you maximize re-use of data, models, features, and process knowledge for even greater productivity gains.

Build more innovative products. With integrated, dynamically interrelated applications, NX helps you introduce technologies and product features that satisfy customer requirements more quickly. You can rapidly investigate product configurations, options and variants. NX automates many time-consuming and routine tasks, leaving more time and resources for innovation.

Improve process efficiency. Fine-tuned by the experience of almost 200,000 customers, NX is developed to improve the efficiency of product development processes and workflows. NX employs industry best practices and company-specific knowledge to automate repetitive tasks, reduce errors and rework, and eliminate process delays.

Reduce costs. By automating repetitive tasks throughout the development cycle, NX helps you reduce overall time and manpower costs. Simulation and validation tools identify costly errors, and reduce rework and physical prototyping expenses.

Improve product quality. With NX, your product development process is guided by customer and performance requirements to ensure quality products that fulfill market demands. Advanced simulation tools help you correct quality, performance, and manufacturability issues early in development.



NX advantages

A unified, open solution

Why it matters

A master-model based approach to product development brings together all product development tasks and disciplines in a unified solution. Best-in-class tools for each development phase lead the industry in depth of capability to improve overall productivity. With a leading-edge, open foundation, NX helps you realize greater returns on all of your technology investments.

Integrated simulation, validation, optimization

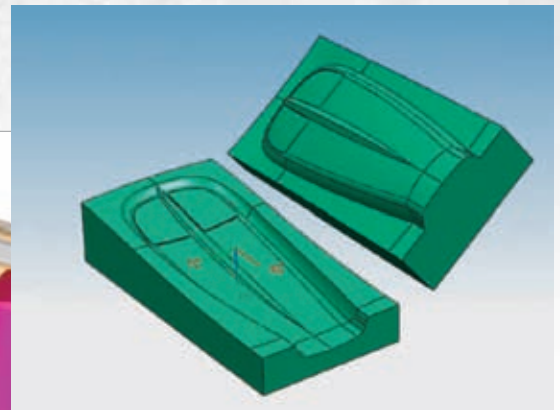
Comprehensive simulation and validation tools in NX automatically check performance and manufacturability at every step of the development process, for closed-loop, continuous, repeatable validation. They help improve quality while reducing errors and physical prototyping costs.

Knowledge-driven automation

NX helps you capture and re-use your organization's unique product and process knowledge to automate development. You can leverage your experience and expertise in optimized, repeatable processes to improve quality and productivity.

Engineering process management

Integrated product information and process management in NX provides a structured environment that links people with knowledge they need to excel in all stages of product development. You can improve collaboration, optimize workflows, manage change, quickly create product options and variants and dramatically improve process efficiency.



NX for industrial design and styling

Industrial design and styling infuse products with aesthetic and ergonomic innovations that increase their perceived value to customers. NX offers you high-performance shape modeling, analysis and visualization tools that help establish distinctive styling and competitive differentiation.

Power, control, and flexibility for freeform shapes

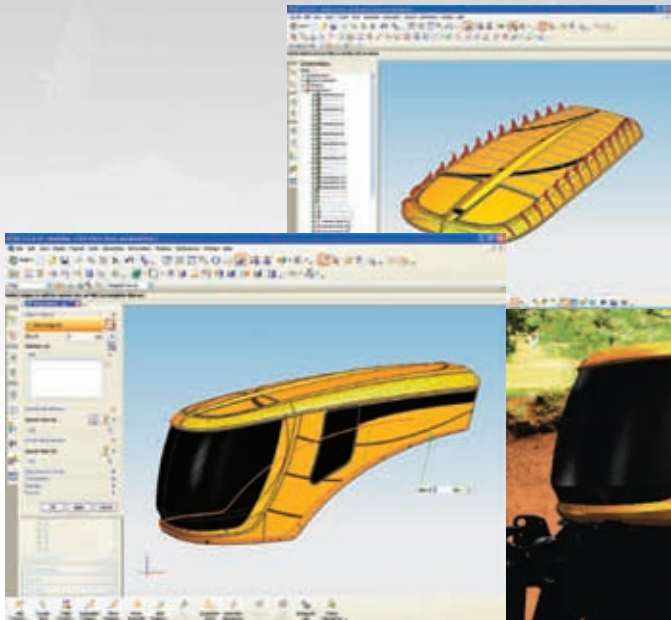
NX delivers powerful and flexible freeform design that supports creativity, exploration and innovation. Designers can quickly create and refine organic shapes with 2D and 3D curve and surface modeling, blending, trimming, extension, transition, sweeping and other techniques with the highest degree of control over shape and continuity. NX also supports reverse engineering with tools for analyzing scanned data and converting it to production surface models. These highly specialized tools join traditional CAD modeling and documentation capabilities to deliver more power and more options for complex design tasks.

Surface analysis and visualization

NX helps designers evaluate concepts for surface quality and appearance with real-time analysis and visualization. Highlight and reflection lines, curvature analysis, dynamic sectioning, draft analysis and reflection mapping provide instant, detailed feedback that improves design quality and manufacturability. Realistic imaging enables designers to explore shapes and styling in typical customer environments, and to quickly experiment with color, materials and finish.

Integration with product engineering

NX ensures a seamless transition from industrial design and styling to product engineering – without rework, compromise, or data conversion – so your innovations get to market faster. This integration preserves design and styling intent through engineering, simulation, and manufacturing, eliminating delays between critical development stages.



NX for design

Design freedom

NX liberates designers from constraints imposed by traditional systems. It supports virtually any design methodology – including parametric, feature-based solid modeling, curve and surface design, and explicit geometry. With the industry's broadest range of modeling techniques and options, you can design your products with greater speed, ease and efficiency. NX also includes unique direct modeling and advanced geometry selection tools, enabling designers to work directly with imported CAD geometry, regardless of the model's origin or construction history.

Superior performance for large assemblies

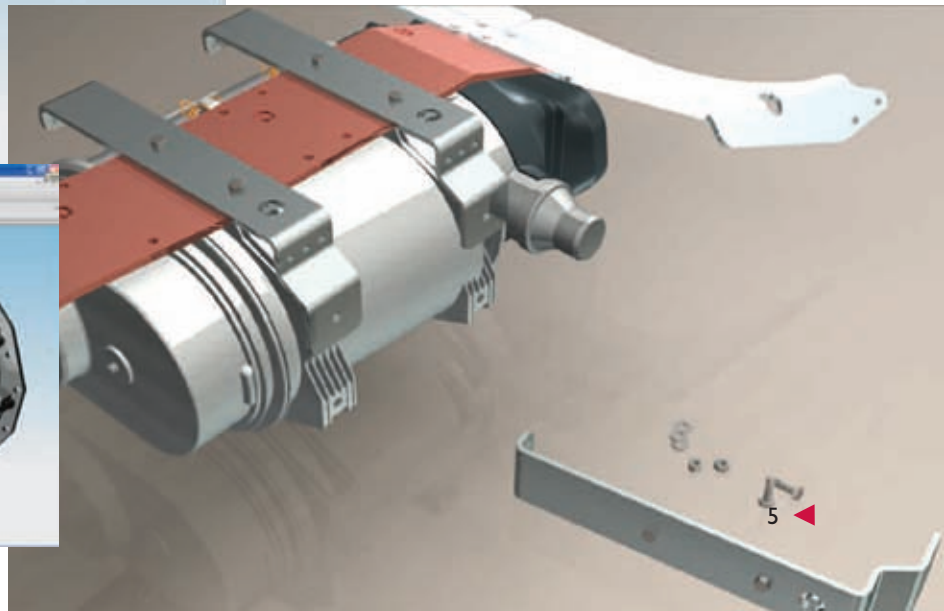
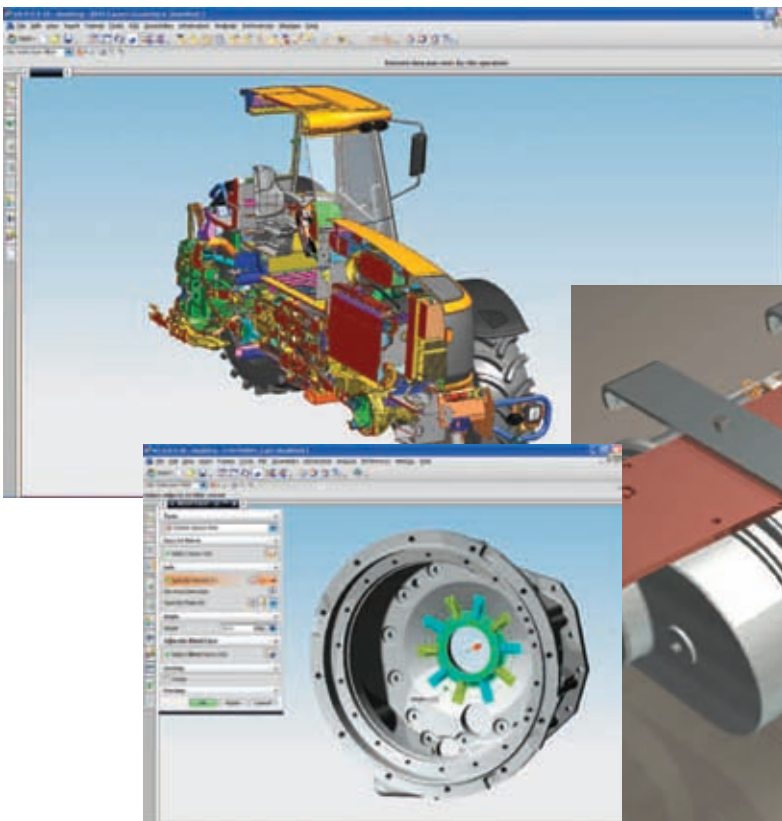
No matter how large or complex your products, NX delivers high-performance modeling that lets your designers work in the full context of the assembly – even with assembly components from other CAD systems. With "lightweight" model representations and fast rendering, NX can handle massive assemblies with interactive, real-time performance. Multi-CAD mockup and assembly engineering are conducted in the active design environment, for instantaneous resolution of problems. Integrated data management, collaboration tools and libraries accelerate component location and placement, and promote re-use of design elements.

Process-specific design tools

With process-specific design tools, NX is far more productive than general-purpose CAD systems. Task-oriented environments for sheet metal design, routed mechanical and electrical subsystems, automotive vehicle design, and ergonomic design include tailored functions that automate and accelerate these specialized design tasks.

Design validation

NX continuously monitors your designs for adherence to standards and requirements. Automated checking tools validate the design against customer and regulatory requirements, engineering rules, or company standards and best practices. With automated validation you design products right the first time, eliminating costly errors and redesign.



NX for simulation

Pressures to reduce cost and improve quality are driving growth in the use of digital simulation throughout the product lifecycle. NX simulation enables you to evaluate more concepts, facilitates faster and more informed decision-making, and reduces direct costs associated with physical prototyping and product failures.

Product quality with fewer prototypes

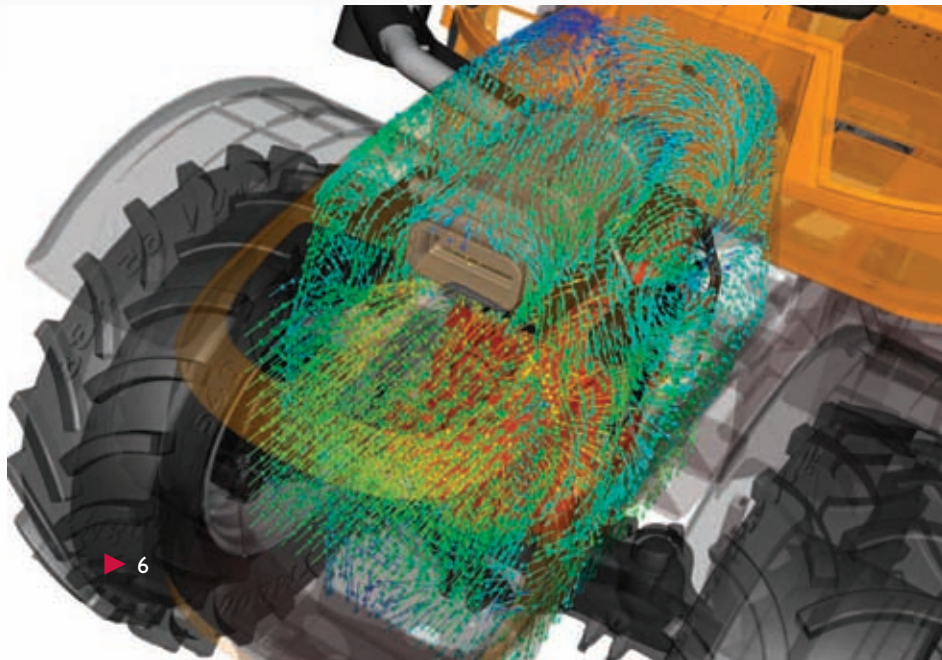
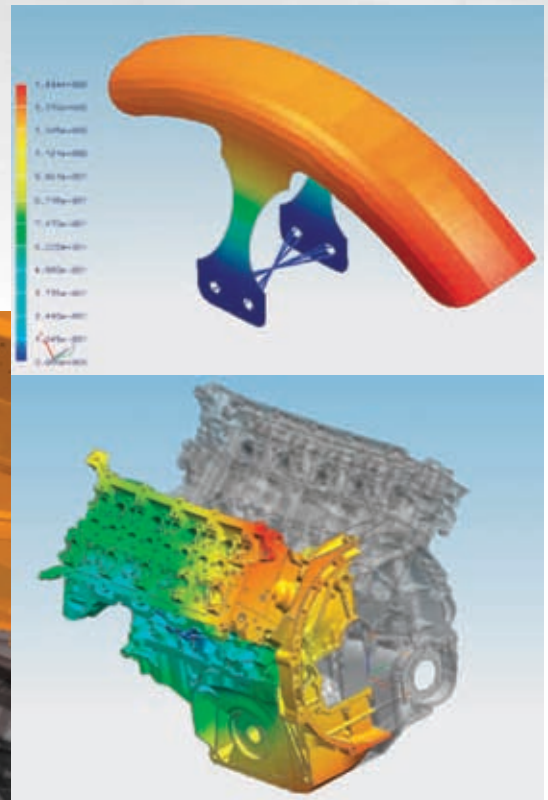
With NX simulation, you can quickly and accurately model and analyze product performance characteristics. Real-time simulation solves the most complex computer aided engineering (CAE) problems, delivering results in time to impact the design. By managing simulation data and processes, NX improves access to performance information and provides critical workflow controls and a best-practices framework.

Design-integrated simulation

NX moves simulation forward in the development cycle with tools designers can use to quickly evaluate the behavior of parts and assemblies. Simulation wizards, available within the NX modeling session and launched with a simple drag and drop, provide non-expert users with a guided process and fast feedback on structural and vibration performance. Other design-integrated simulation tools include shape optimization that predict the best geometric and mechanical parameters for a design based on simulation results, and motion simulation that predicts static, dynamic, and kinematics behavior of assemblies.

Simulation for the CAE specialist

For CAE experts, NX delivers an advanced simulation toolset with industry-leading tools for building complex mathematical models, solvers for advanced multiphysics simulation, and comprehensive postprocessing for interpreting and communicating results. All NX simulation tools take advantage of the high-performance capabilities of NX Nastran, capable of solving the world's most complex engineering problems and recognized as the industry standard for reliability, robustness and power.



NX for documentation

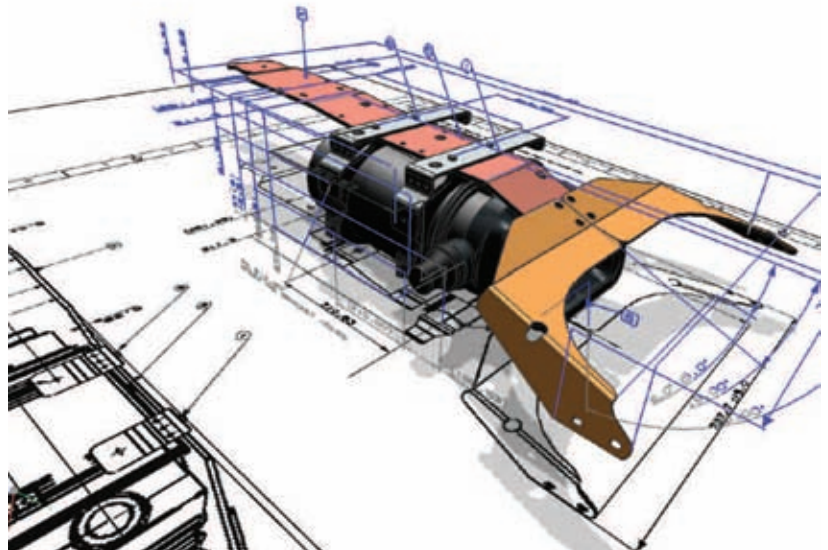
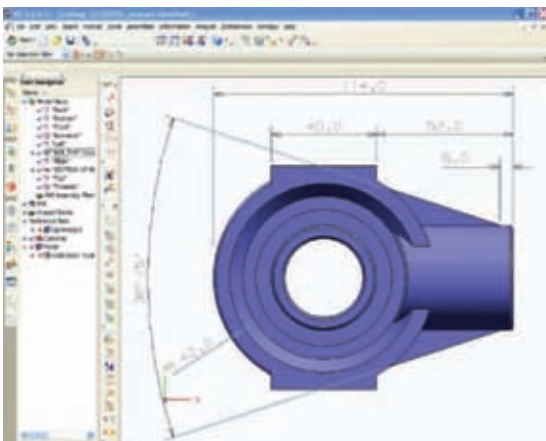
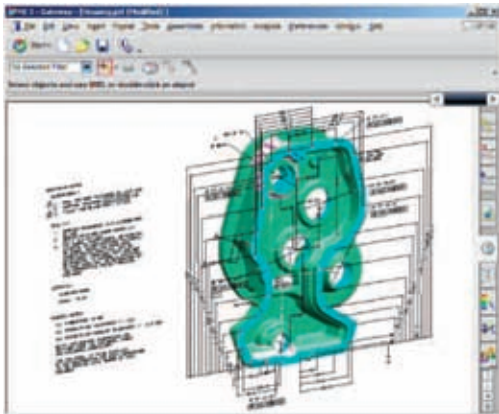
Documenting your product designs is traditionally a tedious and time-consuming process, but it is critical for communicating design intent throughout the development team and the supply chain. NX delivers comprehensive capabilities that streamline and accelerate the process, including 3D annotation and production drafting tools.

3D annotation enhances product definition

Three-dimensional annotation tools in NX capture product and manufacturing information (PMI) directly with the geometric product model. PMI can include dimensions, tolerances, reference geometry, finishes, notes, symbols and other information. With 3D annotation, product teams can incorporate product and process information during the design phase to improve communication and reduce errors. Downstream processes – including drafting, visualization, tolerance analysis and manufacturing – can reference and re-use PMI for greater accuracy and efficiency. NX PMI tools adhere to new standards for 3D annotation that promote drawingless development, using the enriched product definition embodied in the digital solid model.

More efficient drawing production

NX provides next-generation drafting tools that streamline creation and maintenance of engineering drawings. Drawing templates, dragged and dropped onto a solid model, accelerate the process by automatically creating standard layouts and drawing elements and configuring standards-compliant settings. View, dimensions, annotations and other information from the 3D product model can automatically populate the drawing, eliminating the need to re-create data. Full model-to-drawing associativity helps manage and implement changes. All drafting, detailing and dimensioning tools can be rapidly configured to comply with company or industry drafting standards.



NX for tooling

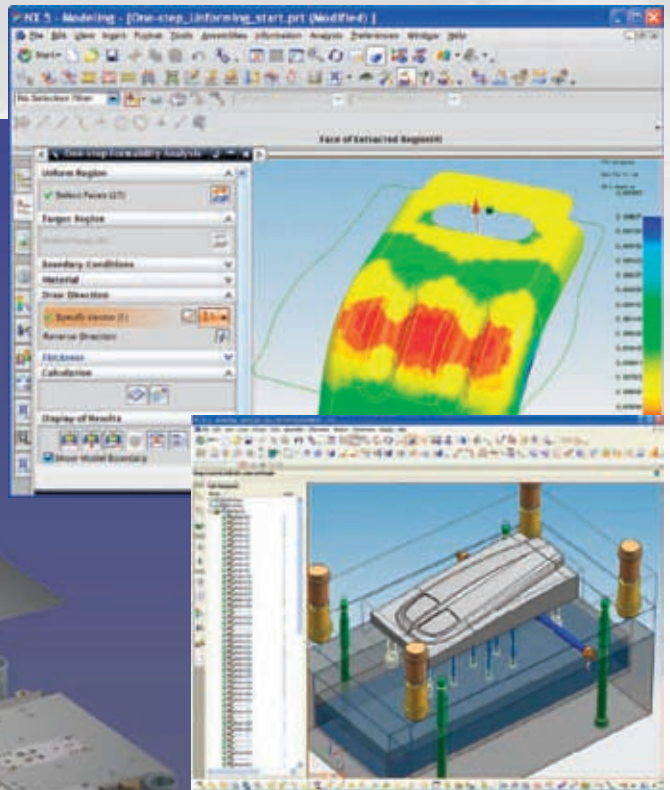
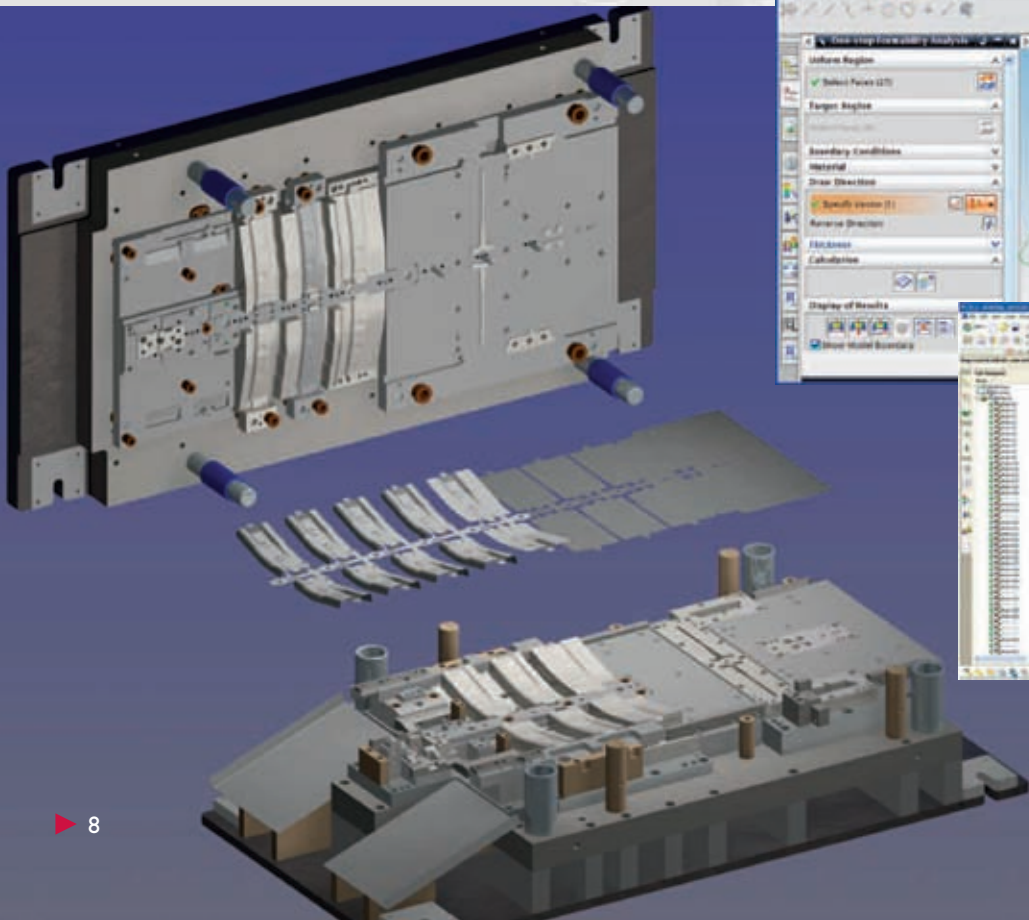
Tooling design and manufacture is on the critical path of new product introduction cycles, especially where time to market is crucial. The quality of the finished product is directly related to the quality and design of the tooling. NX offers a powerful set of automated applications for mold, die, and fixture design that help you move from part design to finished tool in far less time than with traditional CAD applications.

Advanced tooling solutions

NX mold and die tooling solutions capture the knowledge of experienced tool designers, embedding them in highly productive commands and guided, best-practice workflows. Tooling designs are dynamically associated with the part model to ensure accuracy and efficient implementation of part changes in the tooling. Molding and forming analysis tools are included to validate part manufacturability, while clearance and interference checking validates the overall tool design. Tool designers can capture design configurations, including standard tool components, in templates that can be applied to accelerate new tooling projects.

Fastest tooling process from design to production

NX combines tool design with NC programming, electrode design, process planning, simulation, and inspection to streamline the entire tooling development cycle. NX tooling applications are integrated with data and process management capabilities that control tooling design and machining process data. These capabilities simplify change management, collaboration, configuration control, access management, and connection to production and the shop floor.



NX for machining

NX delivers a proven solution for machine tool programming that enables companies to maximize the throughput of their most advanced machine tools. With NX CAM, companies can transform their NC programming and machining processes to dramatically reduce waste and significantly boost productivity.

Broad machining process coverage

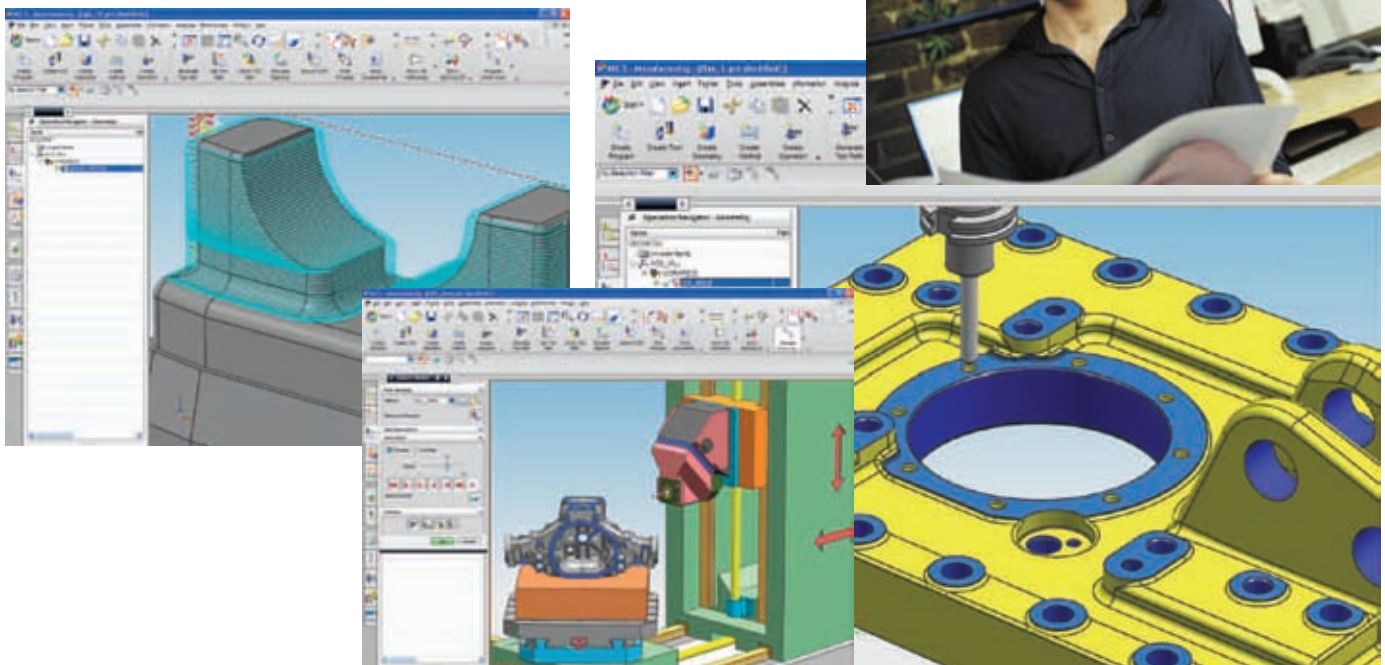
Siemens leverages its world leadership in CAM to deliver broader programming capability and greater flexibility in machining methods. From fundamental turning, milling and wire EDM programming through complex 5-axis, high-speed and multifunction machining, NX tool path processors improve program quality and machine tool efficiency. NX is the ideal CAM solution for manufacturers who have invested in advanced machine tool technology for a competitive advantage.

All-in-one system

NX brings together all the elements of a comprehensive NC programming system, including tool path creation and verification, post processing, machine tool simulation, data conversion tools, process planning, shop documentation, and advanced CAD for part, tool and machine modeling and assembly. Manufacturing data management tools capture, organize and control machining data and connects it to tooling, fixture, and machine resources.

Productivity through automation

Automation in NX makes programming faster and more repeatable, and it requires less programming expertise to get good results. Programmers can use templates that automatically apply preferred machining methods and tooling. Process wizards capture company standards to guide programmers in applying machining best practices. Advanced feature-based machining automates process selection and tool path generation based on features in the part model, reducing programming time by more than 90 percent.



About Siemens PLM Software

Siemens PLM Software, a division of Siemens Automation and Drives (A&D), is a leading global provider of product lifecycle management (PLM) software and services with 4.3 million licensed seats and 47,000 customers worldwide. Headquartered in Plano, Texas, Siemens PLM Software's open enterprise solutions enable a world where organizations and their partners collaborate through Global Innovation Networks to deliver world-class products and services. For more information on Siemens PLM Software products and services, visit www.siemens.com/plm.

Siemens PLM Software leads to greater innovation

There is no single road to innovation, but there are signs you're headed in the right direction. Leading innovators get to market faster, manage compliance, optimize resources and achieve globalization. They're also four times more likely to use PLM software to plan, define, build and support their products. Siemens PLM Software's family of PLM solutions helps businesses establish Global Innovation Networks that transform their process of innovation. Drive your business to greater innovation and accelerate your growth.



MOVE FASTER



BE COMPLIANT



GET OPTIMIZED



GO GLOBAL

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