Solution Overview

NVIDIA

Powering AI-Accelerated Design and Visualization Workflows in Manufacturing

NVIDIA RTX 2000 Ada Generation

Image courtesy of Rob Wolkers

Market Overview

Manufacturers are under constant pressure to reduce costs, optimize products, expedite development cycles, and enhance team efficiency. Technologies such as 3D design, XR, rendering, simulation, virtualization, digital twins, and AI have led to rapid changes to industry workflows. The transformation of analog processes to digital, and the retention of knowledge, process, and legacy projects—in the form of data—sets the stage for radical transformations with GPU-powered solutions.

RTX 2000 Ada Generation for Manufacturing Workflows

Manufacturing and industrial workflows are rapidly evolving due to advancements in AI and accelerated computing. The **NVIDIA RTX™ 2000 Ada Generation** GPU, powered by the ultra-efficient **NVIDIA Ada Lovelace architecture**, empowers you to embrace this future with a robust set of features designed to streamline your entire workflow, from conceptual design to production and beyond. It combines the latest generation Tensor Cores, RT Cores, and CUDA® Cores with 16GB of memory for accelerated AI, rendering, graphics, and compute performance. With the RTX 2000 Ada, design engineers can enhance the quality and realism of their product designs by implementing photorealistic 3D rendering with real-time ray tracing into their workflows and running more upfront simulations.
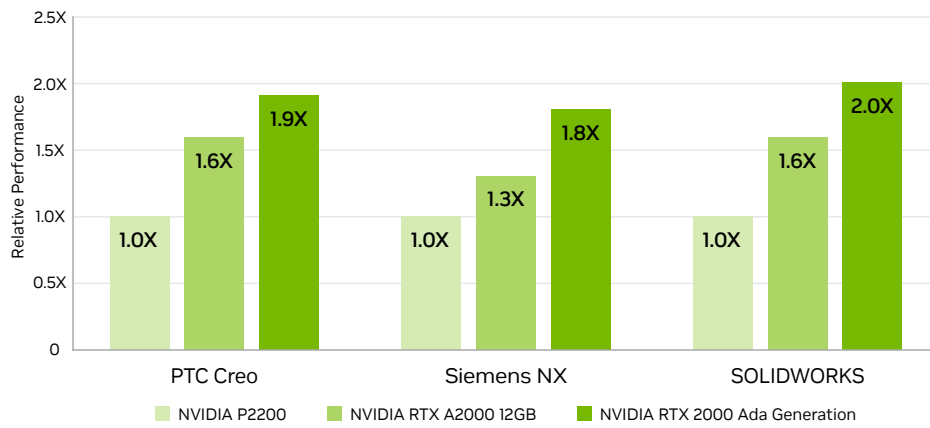
The RTX 2000 Ada enables an immersive experience for enterprise virtual-reality workflows, such as product design and engineering design reviews, accelerating the product development cycle, and empowering designers and engineers to bring products to market faster.

Product designers and engineers engaged in multi-application workflows with AI-powered tools, multi-display setups, and high-resolution content, put significant demands on GPU memory. With its blend of memory, performance, versatility, and AI capabilities, the RTX 2000 Ada helps professionals to work faster and better with their data and setups.
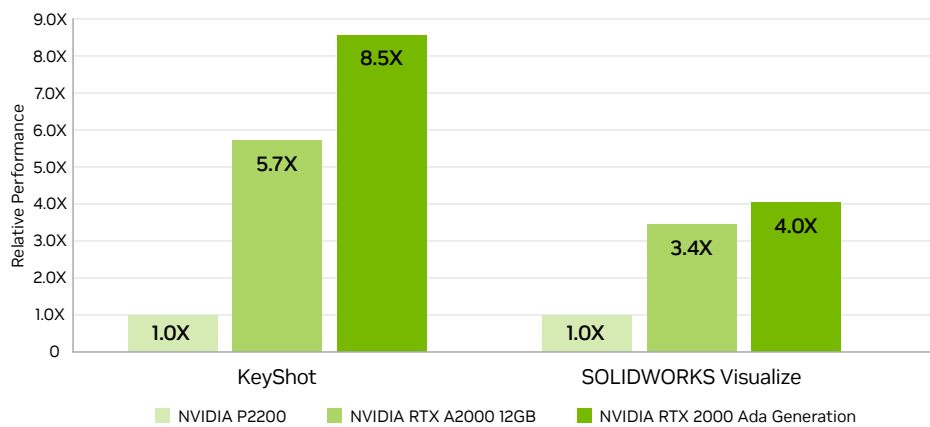
Use Cases

> **3D Modeling:** RTX 2000 Ada enhances performance in CAD applications, allowing engineers and designers to create complex 3D models with increased speed and accuracy.

> **Generative Design:** Explore a wider range of design options and automatically generate designs that meet specific performance and manufacturing constraints.

> **Engineering Simulations (CAE):** Leverage NVIDIA-accelerated CAE for earlier insight into product performance.

> **Realistic Product Prototyping and Rendering:** Create photorealistic 3D models and prototypes for presentations, marketing materials, and user experience design.

> **Virtual Reality (VR) Design Reviews:** Conduct collaborative VR design reviews where engineers and designers can interact with 3D models in a virtual environment.

> **Edge Computing Applications:** Deploy RTX 2000 Ada on manufacturing equipment at the edge, allowing for faster response times and reduced latency.

CAD

Relative Performance (Y-axis)

	PTC Creo	Siemens NX	SOLIDWORKS
NVIDIA P2200	1.0X	1.0X	1.0X
NVIDIA RTX A2000 12GB	1.6X	1.3X	1.6X
NVIDIA RTX 2000 Ada Generation	1.9X	1.8X	2.0X

■ NVIDIA P2200   ■ NVIDIA RTX A2000 12GB   ■ NVIDIA RTX 2000 Ada Generation

Tests run on an Intel Core i9-12900K Processor @ 3.2GHz (5.2GHz Turbo), 64GB RAM, Windows 11 Enterprise x64, SPECviewperf 2020, NVIDIA Driver 550.76. Relative speedup for 4K PTC Creo, Siemens NX, and SOLIDWORKS viewset scores. Performance based on pre-release build, subject to change.

Rendering

Relative Performance (Y-axis)

	KeyShot	SOLIDWORKS Visualize
NVIDIA P2200	1.0X	1.0X
NVIDIA RTX A2000 12GB	5.7X	3.4X
NVIDIA RTX 2000 Ada Generation	8.5X	4.0X

■ NVIDIA P2200   ■ NVIDIA RTX A2000 12GB   ■ NVIDIA RTX 2000 Ada Generation

Tests run on an Intel Core i9-12900K Processor @ 3.2GHz (5.2GHz Turbo), 64GB RAM, Windows 11 Enterprise x64, NVIDIA Driver 550.76. KeyShot geomean (time - seconds), SOLIDWORKS Visualize geomean (time) 1080p tests. Performance based on pre-release build, subject to change.

"Today's design and visualization workflows demand more advanced compute and horsepower. Equipped with next-generation architecture and a large frame buffer, the RTX 2000 Ada Generation GPU improves productivity in my everyday industrial design and engineering workflows, allowing me to work with large datasets in full fidelity and generate renders with more lighting and reflection scenarios 3x faster."

Rob Wolkers, owner and senior industrial design engineer, Rob Wolkers Design and Engineering

Key Features

Fourth-Generation Tensor Cores

> Drive new workflows with dedicated Tensor Cores for AI-enhanced tasks like generative design and automated quality inspection. Tensor Cores provide incredible AI performance to support the development of optimized designs and ensures high-quality production standards through precise defect detection and automated corrections.

Third-Generation RT Cores

> Experience a significant performance boost with up to 1.7x increased throughput compared to the previous generation. These cores enable real-time ray tracing and shading, which accelerates product development by allowing for quick design reviews with high-fidelity visualizations. Accurate materials, lighting, and reflections enable real-time evaluations of new product concepts and the creation of stunning marketing content directly from CAD geometry.

Ada Architecture CUDA Cores

> Boost engineering simulation with real-time structural, thermal, and fluid flow analysis tools. Engineers can quickly assess design changes and optimize performance. NVIDIA Ada architecture-based CUDA cores double the single-precision floating-point throughput and improve power efficiency compared to previous generations, unlocking new potential for the industry.

16GB of GDDR6 Memory

> The RTX 2000 features 16GB of GDDR6 memory, ensures smooth operation even when designers and engineers are working interactively with large datasets or running multiple applications simultaneously. This substantial memory, coupled with 224 GB/s bandwidth, allows for seamless multitasking across design, analysis, and visualization tools, enhancing productivity throughout the manufacturing lifecycle.

Low-Profile Form Factor

> With its low-profile, dual-slot, and energy-efficient 70W design, the RTX 2000 Ada integrates seamlessly into any manufacturing environment, from space-constrained workstations to energy-conscious deployments. It even allows for deployment directly on factory equipment for real-time data processing and analysis at the edge.

Ready to Get Started?

To learn more about NVIDIA RTX 2000 Ada Generation, visit
www.nvidia.com/rtx-2000

For more information on NVIDIA solutions for manufacturing, visit **www.nvidia.com/mfg-pd**