

Nuremberg, 20 June 2023

Paris Airshow

Siemens solutions for sustainable aviation

- **Lighter, faster and more efficient aircrafts are needed to reduce emissions in aviation**
- **By leveraging Siemens Xcelerator – our open, digital business platform – companies achieve digital transformation easy, fast, and at scale**
- **With SINUMERIK ONE, our digital native CNC, aerospace manufacturers can take high-end part manufacturing to the next level**

Aerospace industry has many challenges ahead: cost pressure, changing market conditions, and society's demand for sustainable mobility. Automation and digitalization are helping airplane manufacturers to take up these challenges and reach climate targets like 'Fly Net Zero'. Therefore, Siemens offers a wide range of solutions for aviation along the entire value chain – from the concept and design until an aircraft is ready for take-off and through end of service. Siemens portfolio consists of design and simulation software, manufacturing automation and management, robotics, composite solutions, intelligent building automation management systems and lifecycle management software.

Achieving digital transformation easy, fast, and at scale

Siemens' vision for digital transformation goes beyond connectivity and traceability. Connecting data is just the beginning. By leveraging Siemens Xcelerator – our open, digital business platform – companies can make their data work for them with generative design and closed-loop optimization to help the aerospace and defense industry accomplish more than ever imagined.

With Siemens Xcelerator, customers benefit from the full openness of technology, an extensive portfolio of end-to-end solutions – from multi-domain design and engineering

to manufacturing, asset management and optimization – and the equal interaction of market players, partners, suppliers and customers in a broad ecosystem.

Driving value across the entire product development process

Digitalization enables customers to take complexity head on, allowing greater productivity and innovation. Siemens Xcelerator offers a portfolio of software designed around industry best practices to provide visibility, collaboration, automation and traceability. At Siemens, we leverage the digital twin and a roadmap of industry-specific business workflows to digitally and continuously connect all tasks and processes in the value chain – including suppliers. Siemens solutions span the entire product lifecycle to help customers in the aerospace and defense industry advance digital transformation maturity in the critical areas of systems, design/engineering, manufacturing, and service lifecycle. Customers realize impact by implementing software based on the challenges they need to solve and priorities for their business.

Connecting IT & OT: Siemens Xcelerator and Industrial Operations X

Combining the information technology (IT) from the top floor with the operational technology (OT) from the shop floor enables precise data-driven decision making. This leads to a continuous closed loop of optimization, both for the product and the production. A seamless data flow along the entire value chain bridges the gaps between information silos and connects everything from design to realization. Industrial Operations X is Siemens' continuously growing, interoperable portfolio geared towards production engineering, execution, and optimization which Siemens is adding to its portfolios on Siemens Xcelerator. With Industrial Operations X, Siemens is consistently integrating IT and software capabilities into the world of automation. This becomes possible due to for instance the industrial Internet of Things (IIoT), our huge variety of Edge Apps, our cloud solution Insights Hub (formerly known as MindSphere) and Mendix, our low-code app development tool. Hence, aerospace manufacturers can speed up their transition from automated to highly adaptable production.

Efficient Part Manufacturing

Manufacturing airplanes requires a flexible and efficient production. Based on Siemens' unique experience in machine operation and motion control and aviation know-how, Siemens can provide solutions for optimizing engine and structure part

production and shape accuracy and surface quality. Aircraft propulsion is undergoing ongoing changes: Turbine (Engine) technology is getting better at fuel-efficiency and emission reduction.

With SINUMERIK ONE, our digital native CNC, aerospace manufacturers can take high-end part manufacturing to the next level. The leading-edge CNC system combines maximum speed with highest possible path precision when machining free-form surfaces and fluid CNC operation even in high-load scenarios. Based on the SINUMERIK ONE digital twin, machine development and commissioning, production planning and workpiece machining, machine expansions and services can be transferred from the real world to a virtual environment, which significantly speeds up production. Moreover, CNC Robots can be used not only for drilling and milling technologies but also for additive manufacturing, painting applications and composite manufacturing – the highest path accuracy, flexibility and mobility are guaranteed.

Lighter, faster and more efficient aircrafts are needed to reduce emission in aviation. Additive manufacturing can play a decisive advantage. Part design can be optimized thanks to completely new construction methods. By utilizing the design freedom in additive manufacturing, weight and thus required material can be significantly reduced – optimizing both production costs and carbon footprint of the parts. In addition, lighter parts are also saving significant emissions during the operation of the aircraft. Another way to lighter parts and a more sustainable aviation is using composite manufacturing with fiber composite parts.

Assembly

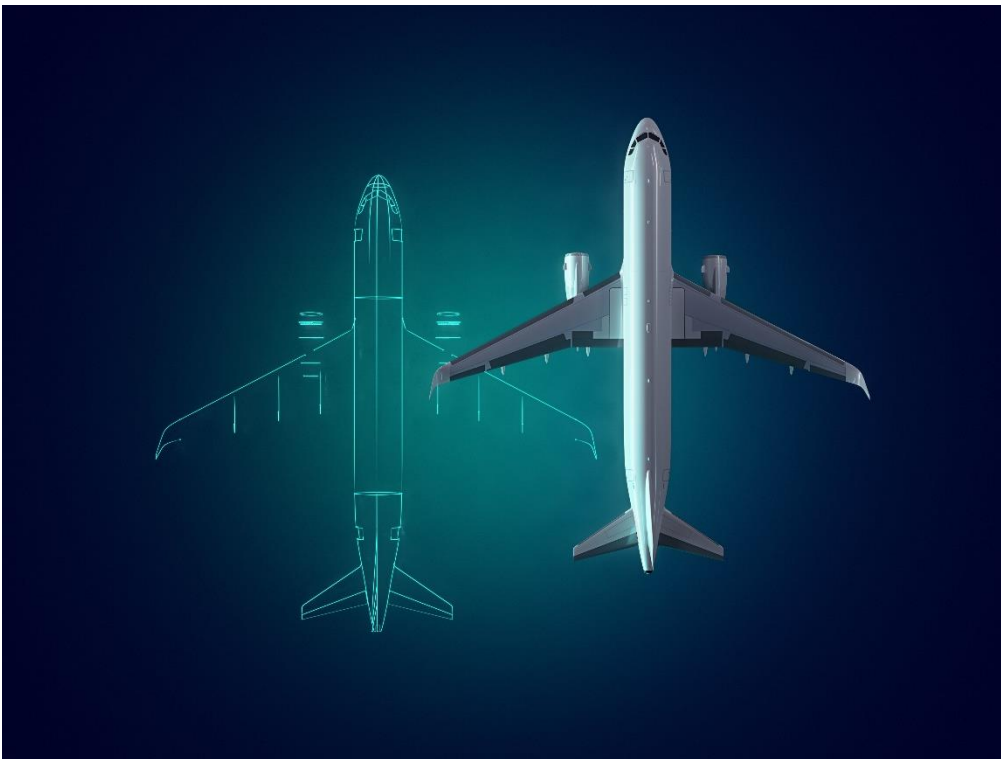
Reliable and high-quality aircrafts depend on efficient coordination of (global) supply chains, synchronized production operations and coordinated pre-assembly and final-assembly processes. Opcenter, Siemens' Manufacturing Execution System, sends individual configuration information to the correct stations on the production line. It continuously monitors production to ensure high-quality manufacturing and assembly. To overcome the challenges of the future, aerospace manufacturers need to transform traditional production and logistics processes to more dynamic and efficient ones. The platform SIMOCRANE and Automated Guided Vehicles (AGV) e. g. SIMOVE realize

flexible and even self-organizing logistic concepts. Siemens owned Platforms like Simocrane or Simove can realize flexible and even self-organizing logistic concepts.

Connectivity, Power and Infrastructure

Siemens customers can benefit from our unique expertise in industrial communication and networking. Siemens offers not only numerous identification and localization solutions, but also efficient network infrastructure. With Atos, the global leader in digital transformation and cyber security solutions, Siemens guarantees network security, Wi-Fi and remote communication.

Siemens also provides solutions for industry-specific services focused on optimal asset management such as trainings and support hotlines, spare parts, repairs and retrofits. On the path to digital production, this portfolio can help the aerospace manufacturers identify untapped optimization, avoid unplanned downtime and improve production by better integration in IT processes and modern data analytics.



This background information is available at <https://sie.ag/443B5A3>

Further information

- Website on [Siemens aviation portfolio](#)
- Talking Digital Industries Podcast episode [Aerospace industry – Flying high with digitalization](#)
- Article on how Siemens Simcenter is helping the aviation industry make [Fly Net Zero by 2050](#) a reality

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Siemens Digital Industries (DI) is an innovation leader in automation and digitalization. Closely collaborating with partners and customers, DI drives the digital transformation in the process and discrete industries. With its Digital Enterprise portfolio, DI provides companies of all sizes with an end-to-end set of products, solutions and services to integrate and digitalize the entire value chain. Optimized for the specific needs of each industry, DI's unique portfolio supports customers to achieve greater productivity and flexibility. DI is constantly adding innovations to its portfolio to integrate cutting-edge future technologies. Siemens Digital Industries has its global headquarters in Nuremberg, Germany, and has around 72,000 employees internationally.

Siemens AG (Berlin and Munich) is a technology company focused on industry, infrastructure, transport, and healthcare. From more resource-efficient factories, resilient supply chains, and smarter buildings and grids, to cleaner and more comfortable transportation as well as advanced healthcare, the company creates technology with purpose adding real value for customers. By combining the real and the digital worlds, Siemens empowers its customers to transform their industries and markets, helping them to transform the everyday for billions of people. Siemens also owns a majority stake in the publicly listed company Siemens Healthineers, a globally leading medical technology provider shaping the future of healthcare. In addition, Siemens holds a minority stake in Siemens Energy, a global leader in the transmission and generation of electrical power.

In fiscal 2022, which ended on September 30, 2022, the Siemens Group generated revenue of €72.0 billion and net income of €4.4 billion. As of September 30, 2022, the company had around 311,000 employees worldwide. Further information is available on the Internet at www.siemens.com.